

TECHNOLOGY DEPT

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Construction Methods

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JUN 20 1941

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JUNE 1941

Army and Navy Defense Projects *in* Southeastern States

A 10-page article, with 53 photographs, dealing with a \$200,000,000 program of diversified construction, including airfields and runways, hangars, barracks, warehouses, sewers, water supply, repair shops, housing.

also

2 pages of pictures showing applications of SMALL TOOLS on defense construction work

UNCOMMON BUILDING METHODS
Air Base in Southeastern States
Design, Planning, Construction
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CURRENT JOBS

.... and Who's Doing Them

BUILDINGS

Public—Navy Department awarded \$13,000,000 contract to **Goode Construction Corp.**, **Blythe Bros. Co., Inc.**, and **Harrison Wright Co.**, of Charlotte, N. C., for construction of tent camp and division training facilities, including barracks, mess halls, officers' quarters, storehouses, hospitals and administration buildings, at New River, N. C. A \$10,988,000 foundation contract for Ford Motor Co.'s manufacturing plant for bombing planes in Ypsilanti, Mich., went to **J. A. Utley**, of Royal Oak, Mich. In Ravenna, Ohio, **Hunkin-Conkey Construction Co.**, of Cleveland, will erect ordnance plant for War Department at estimated cost of \$5,000,000. **Revere Copper & Brass, Inc.**, of Chicago, was awarded \$10,000,000 War Department contract for additional plant facilities in Chicago, Ill.; Defense Plant Corp. will finance. **Whittenberg Construction Co., Struck Construction Co., Highland Co., Inc.**, and **G. M. Eady Co.**, all of Louisville Ky., are constructing housing, hospital and water supply facilities at Fort Knox, Ky., for \$3,736,735.

J. G. White Engineering Corp., of New York, was awarded contract to improve power plant at New York Navy Yard, Brooklyn, N. Y., for \$3,860,000 cost-plus-fixed-fee basis. In Akron, Ohio, **Clemmer Construction Co.**, local contractor, will erect plant for manufacture of airplane parts for Goodyear Aircraft Corp., at cost of \$3,700,000, including equipment; Defense Plant Corp. will finance. In South Bend, Ind., **Consolidated Construction Co.**, of Chicago, Ill., will construct for Studebaker Corp. 1-story brick aircraft engine assembly plant at price of \$2,661,212; War Department will finance.

Industrial—At Louisville, Ky., **E. I. duPont de Nemours & Co.**, of Wilmington, Del., will build their own \$10,000,000 plant for the manufacture of neoprene synthetic rubber. A smelting plant, in Corpus Christi, Tex., to cost \$5,200,000, will be built by owner, **American Smelting & Refining Co.**, of New York. **J. G. White Engineering Corp.**, of New York, N. Y., is engaged in constructing steam power plant in Mobile, Ala., for Aluminum Ore Co., at estimated cost of \$3,000,000. **Dwight Mfg. Co.**, of Alabama City, Ala., awarded contract for mill addition to cost \$3,000,000, to **Daniel Construction Co.**, of Anderson, S. C. **United Engineers & Constructors, Inc.**, of Philadelphia, Pa., received contract to construct water gas making plant in Syracuse, N. Y., at estimated total of \$1,100,000.

HEAVY CONSTRUCTION

At Camp Borden, Ont., Canada, **Bennett-Pratt Ltd.**, of Toronto, received \$56,000,000 contract to erect aerodrome buildings for Department of National Defense for Air. Contract for dredging 30,000,000 cu.yd. of material in Canal Zone went to **Panama Constructors, Inc.**, of White Plains, N. Y., for \$22,436,086. **Hawaiian Associates**, of New York City, are engaged in constructing seaplane operating facilities and defense housing facilities at Naval Station, Tutuila, Samoa, for approximately \$8,100,000. Shipyard in Richmond, Calif., is under construction by **Richmond Shipbuilding Corp.**, owner, for \$6,000,000; U. S. Maritime Commission will finance. In Tacoma, Wash., five additional shipways are being erected by **General Construction Co.**, of Seattle, for Seattle-Tacoma Shipbuilding Corp., at price of \$3,500,000; U. S. Maritime Commission will finance. Contract for embankment and spillway construction for flood control dam in Somerfield, Pa., went to **Hunkin-Conkey Construction Co.**, of Cleveland, Ohio, for \$3,675,265. Wharf contract, in Nova Scotia, went to **Foundation Maritime, Ltd.**, Halifax, Nova Scotia, for about \$2,250,000. Navy Department awarded drydock contract in Portsmouth, N. H., to **Aberthaw Co.**, Boston, Mass., for \$2,500,000 on cost-plus-fixed-fee basis.

HIGHWAYS AND BRIDGES

Among recent highway and bridge contract awards are the following: Alabama: \$401,050 to **S. R. Batson Construction Co.**, of Birmingham. Illinois: \$456,927 to **Madison Construction Co.**, of Edwardsville. Indiana: \$387,984 to **Grace Construction & Supply Co.**, of Fort Wayne. New Hampshire: \$278,881 to **John Iafolla Construction Co.**, of Dedham, Mass. Nebraska: \$575,528 and \$64,037 to **Western Contracting Corp.**, of Sioux City, Ia., and **Peter Kiewit Sons Co.**, of Omaha, respectively. Ohio: \$284,639 to **Hollinger-Davidson Co.**, of Akron; \$834,472 to **De Salvo Construction Co.** and **J. & F. Harig Co.**, of Cincinnati; \$664,448 to **F. Mashuda**, of Milwaukee, Wis. Oklahoma: \$312,089 to **Lewis Construction Co.**, of Muskogee. Pennsylvania: \$331,353 to **Midwest Construction & Asphalt Co.**, of Uniontown; \$656,565 to **Holmes Construction Co.**, of Wooster, Ohio; \$299,468 to **M. Bennett & Sons**, of Indiana. South Carolina: \$488,897 to **W. F. Bowe, Jr.**, of Augusta, Ga.; \$240,755 to **R. B. Tyler Co., Inc.**, of Louisville, Ky. Tennessee: \$268,658 to **H. E. Wolfe Construction Co.**, of St. Augustine, Fla.; \$619,025 to **Clark, Kearney & Stark**, of St. Louis, Mo.; \$359,013 to **Rae Construction Co.**, of Charlotte, N. C.; \$289,600 to **S. & W. Construction Co.**, of Memphis. Texas: \$262,809 to **Harrison Engineering & Construction Corp.**, of Kansas City, Mo.; \$205,518 to **Cage Bros. & L. A. Turner**, of Bishop; \$294,033 to **Austin Road Co.**, of Dallas.

JUNE, 1941

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Construction Methods

A Pictorial Survey of Current Practice, Equipment and Materials

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A. E. PAXTON, Manager

Editorial Staff: Vincent B. Smith, Paul Wooton (Washington)

N. A. Bowers (San Francisco) Nelle Fitzgerald

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PUBLICATION

The HOW of it

For the benefit of readers concerned with the practical application of method or equipment the following references are to articles or illustrations in this issue that tell:

- How **CIRCULAR DRILL JUMBO** carries six drifters on three radial arms. — p. 39
- How **DEFENSE CONSTRUCTION** for Army and Navy was rushed in Southeastern states. — p. 42
- How **PALMETTO ROOTS** were cut by disk plow to clear land for air base. — p. 44
- How **THREE-HINGED ARCH TRUSSES** for hangar were erected with long-boom crane. — p. 44
- How **ROTARY TILLER** driven by power take-off from tractor aided soil-cement runway construction. — p. 45
- How **WELL POINTS** kept excavation for pumping station dry. — p. 46
- How **BITUMINOUS SURFACING** was applied to airfield runways. — p. 47
- How **ARCHITECTURAL CONCRETE** enhanced appearance of naval air station building. — p. 48
- How **GUNITE COAT** was applied to wire mesh over fiberboard sheathing. — p. 49
- How **RADIAL SAW** precut lumber for building project. — p. 49
- How **DIGGING OF HOLES** was speeded up with use of earth augers. — p. 50
- How **BENDING OF PIPE** was done with hydraulic jack. — p. 51
- How **STEEL SCAFFOLDING** provided working platforms at several levels. — p. 52
- How **HUGE CANVAS TENT** protected earth fill for dam. — p. 53
- How **PREFABRICATED LUMBER** cut time for constructing shipyard. — p. 54
- How **TEMPORARY HOSPITAL BARRACKS** were built for Navy Department. — p. 55
- How **WORLD'S FAIR SALVAGE** was utilized for national defense needs. — p. 56
- How **SIDE BOOM RIG** on tractor loaded material into railway cars. — p. 58
- How **HIGHWAY SLOPES** were finished with tractor-drawn rig. — p. 58
- How **HYDRAULIC PIPE PUSHERS** drove concrete conduit under railroad tracks. — p. 59
- How **PUSHER PLATES** speeded loading of tractor-drawn scrapers. — p. 59
- How **ARMY CAMP ROADS** were paved for both heavy and light duty. — p. 62
- How **TIMBER TRUSSES** were erected to support aircraft plant roof. — p. 64

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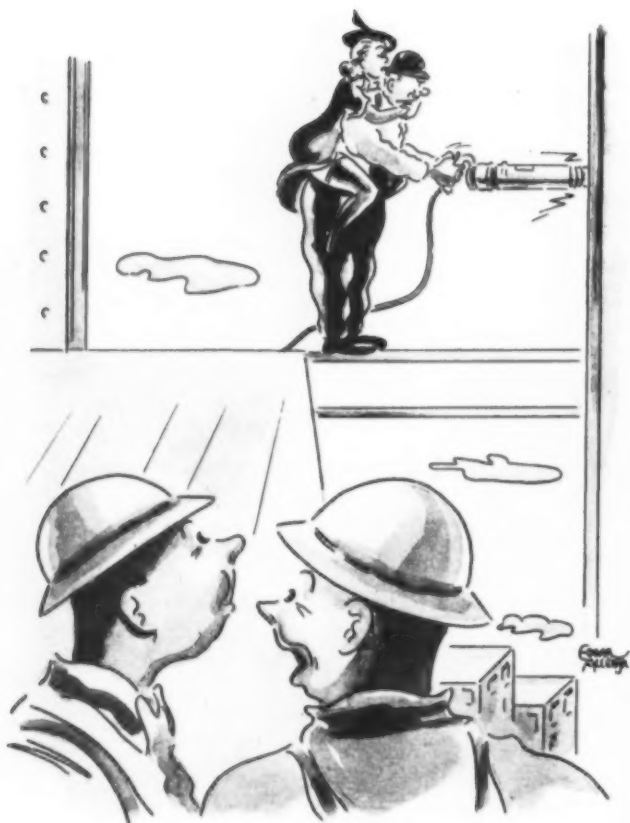
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Circulation Manager

THE JOB JESTER

CARTOONS DRAWN FOR CONSTRUCTION METHODS



"Your wife is on the phone and wants you to bring home a spool of thread."

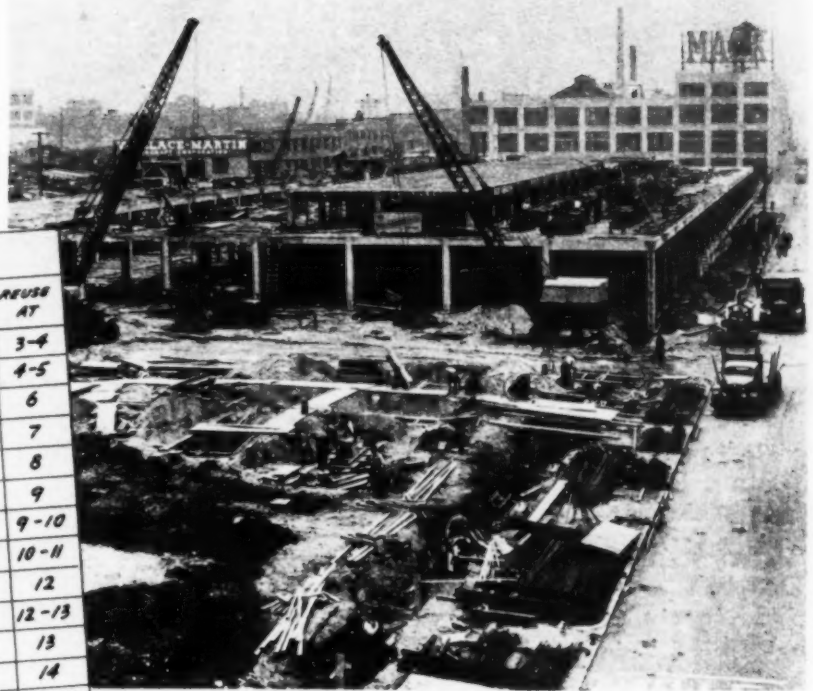


"Murphy married a clinging vine."



"Now! Let him have it, Gus!"

SAVES 4 WEEKS AND \$8255

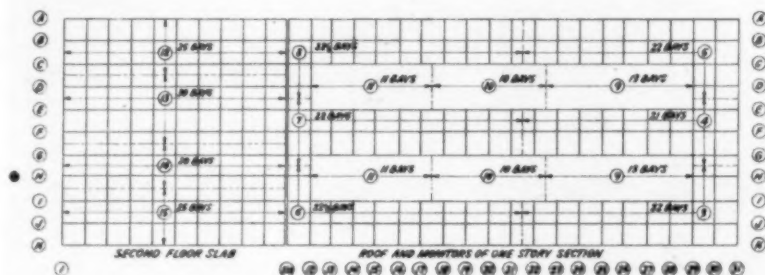


Contractor: Corbetta Construction Co., New York;
Architect-Engineer: Victor Mayper, New York

JOB SCHEDULE									
POUR NO.	LOCATION	NUMBER OF BAYS	EXCAVATION, FOUNDATION GRADE	FORM	REINFORCING AND TRAYS	CONCRETE	STRIP	REUSE AT	
1	ONE STORY BUILDING	32 1/2	SEPT. 21	SEPT. 23-24	SEPT. 25	SEPT. 27	SEPT. 30	3-4	
2		32 1/2	" 23	" 25-26-27	" 26-27	OCT. 1	OCT. 2	4-5	
3		22	-	SEPT. 30 OCT. 1	OCT. 1-2	" 2	" 4	6	
4		21	SEPT. 30	OCT. 1-2	" 2-3	" 3	" 7	7	
5		22	OCT. 2	" 3	" 4	" 7	" 9	8	
6		22 1/2	" 3	" 4	" 7	" 8	" 10	9	
7		22	" 5	" 7-8	" 8	" 9	" 11	9-10	
8		22 1/2	" 8	" 9	" 10	" 11	" 14	10-11	
9		MONITOR	26	-	" 10	" 11	" 14	" 16	12
10		20	-	" 11	" 14	" 15	" 17	12-13	
11		22	-	" 14-15	" 15	" 16	" 18	13	
12	TWO STORY BLDG	25	OCT. 15	" 16	" 17	" 18	" 21	14	
13		30	" 16	" 17-18	" 18-21	" 22	" 24	15-16	
14		20	" 18	" 21	" 22-23	" 24	" 28	17	
15		25	" 22	" 24	" 25	" 28	" 30	18	
16		18	-	" 25	" 28	" 29	" 31	19	
17		32	-	" 28	" 29	" 30	NOV. 1	19	
18		26	-	" 30	" 31	NOV. 4	" 6	-	
19		24	-	OCT. 31 NOV. 1	NOV. 4	" 5	" 7	-	
		MONITOR							
FLOORS ON EARTH ONE STORY BLDG WK. END NOV. 1									
FLOOR " " 2-STORY " " " " 9									

BASIS OF SCHEDULE:
FORMS ARE FURNISHED FOR 68 BAYS. 'INCOR' CEMENT TO BE USED,
PERMITTING COMPLETE STRIPPING 2ND MORNING AFTER POUR.
THE 68 BAYS ARE USED FOR 3 DAYS POUR WITHIN SAME CALENDAR
WEEK. ALL BAYS FOR GIRDERS, BEAMS AND SLABS ARE COMPLETELY
REUSABLE EVERYWHERE.

Utilizing 'Incor's 24-hour service strength and forming only 15% of the area, a carefully prepared progress schedule enabled Corbetta Construction Co., Inc., to complete this factory building in record time—at minimum cost. This job shows that form economies are possible on one- and two-story buildings as well as on multi-story structures.



Planning with 'Incor' Produces Top Speed at Minimum Cost

SPEED is the need of the hour. Good job planning and 'Incor' 24-Hour Cement save vital weeks and often reduce construction costs.

As a result of careful planning, Crawford Clothes factory, occupying an entire city block in Long Island City, New York, was completed in record time—at minimum cost.

Corbetta Construction Co., Inc., general contractors, estimated this one- and two-story building, of reinforced concrete beam-and-girder design, on the basis (1) of forming 50% of the required area, or (2) by using 'Incor' 24-Hour Cement and forming about 15% of the area. Either method meant a time saving of about 4 weeks over usual schedules. But 'Incor' showed a net cost saving of \$8255, as against the extra forms needed for the same construction speed.

'Incor'* was used in the frame; elsewhere Lone Star was used. The job was completed in record time—faster speed at lower cost. Write for copy of "Cutting Concrete Costs." Lone Star Cement Corporation, Room 2266, 342 Madison Avenue, New York.

*Reg. U. S. Pat. Off.

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DEFENSE SPEED-UP

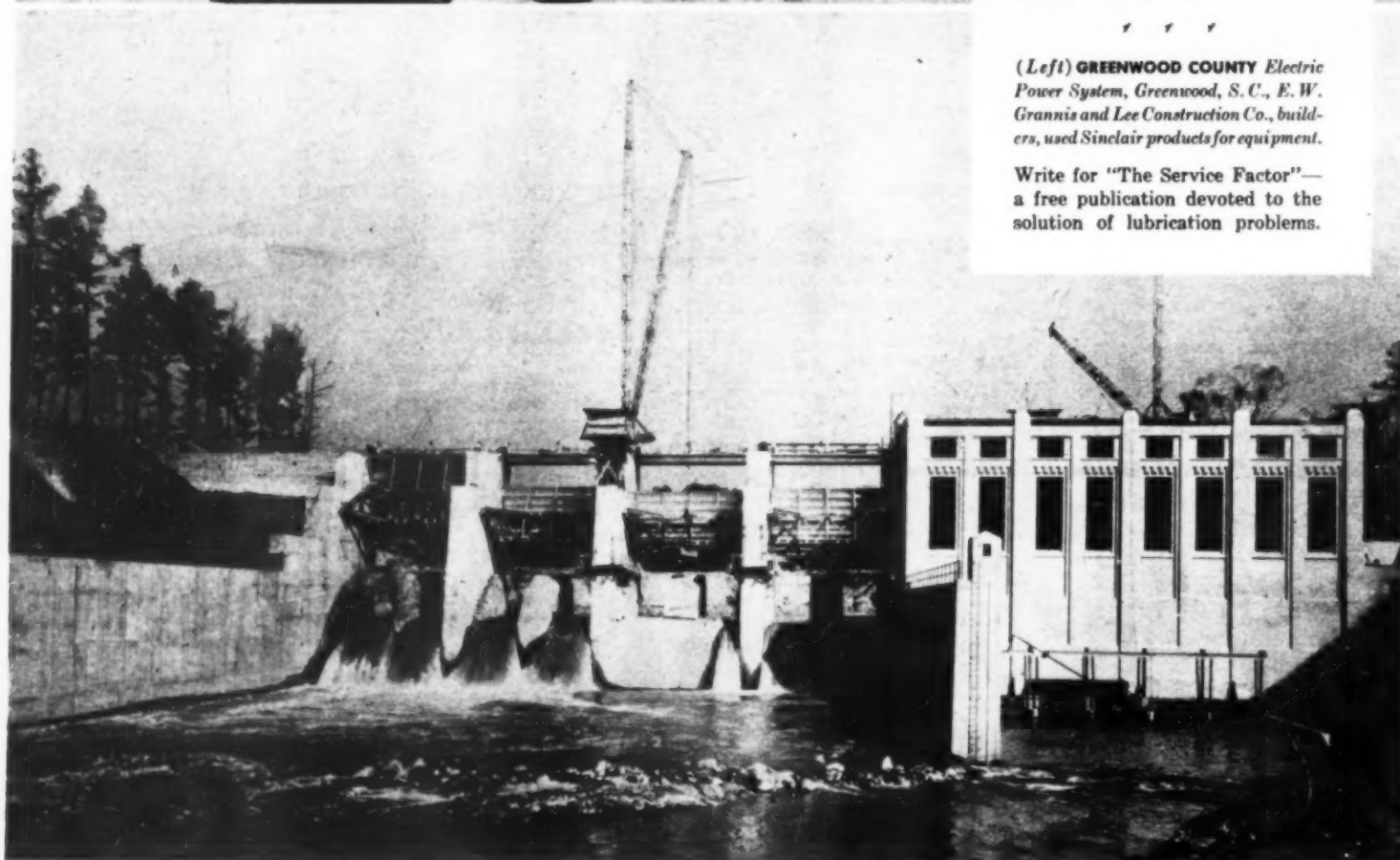
is pushing all types of industrial equipment to the limit of performance. Sustained delivery of full output depends upon *correct* lubrication. For *construction* machinery there are . . .

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designed to keep equipment constantly on the job under extreme service conditions. Sinclair's complete line of lubricants, and fuels, offer you top operating efficiency from your equipment at low maintenance and lubrication costs. For details call the nearest Sinclair office or write Sinclair Refining Company, 630 Fifth Avenue, New York, N. Y.

(Left) **GREENWOOD COUNTY Electric Power System**, Greenwood, S. C., E. W. Grannis and Lee Construction Co., builders, used Sinclair products for equipment.

Write for "The Service Factor"—a free publication devoted to the solution of lubrication problems.



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A message to our customers and friends:

Improving quality and increasing production at the same time is no easy task today—but with your help Euclid is doing it.

Even before defense projects and orders dominated the scene, your steady demand for Euclids kept our factory busy. Old customers bought more Euclids . . . new customers tried Bottom-Dump and Rear-Dump EUCLIDS for the first time—and then came back for more. Equipment sales for 1940 exceeded those for 1939 by more than 50%!

Thus you made it necessary and possible to make important additions and improvements to our manufacturing plant and equipment. When

the defense rush came, Euclid was better prepared . . . trained workmen were ready . . . more machine tools were here or on the way . . . production was stepped up steadily. During the first four months of this year alone, you ordered and received two-thirds as many Euclids as during the whole preceding year.

While trying to keep pace with your growing requirements, Euclid has also remembered the vital importance of quality to economical performance. The superior caliber of Euclid design, material and construction is being consistently maintained and improved. Euclid will continue to supply you with *better EUCLIDS* . . . and more of them!

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HOW IS YOUR NEXT Paving Job GOING TO LOOK?

Like
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YOU can see the profits slipping through your fingers on a job where the finegrading is done by hand if you compare it with the job done by an R-B Power Finegrader!

Visualize slow, costly, inaccurate hand finegrading — men swarming all over the grade building up the low spots, leveling off the high ones — holding up the paver and crew and trucks — leaving an inaccurate grade that costs you either excess aggregate for a slab that's too thick or penalties for a slab that's too thin.

True — you may not get into a jam like the one illustrated but *it has happened* — and with the speed and output of the new pavers it's more likely to happen than ever before.

Compare this with the speed, accuracy and low cost of R-B Power Finegrading. R-B Power Finegraders eliminate the bottleneck on otherwise completely mechanized jobs—in one pass they wipe out all the excess labor, delay and trial and error methods — they cut a grade that's right on the *payline*, accurate and even all the way — they reduce loss of aggregate, reduce your labor costs, keep the grade way out ahead of the paver and **MAKE BIGGER PROFITS POSSIBLE!**

R-B Power Finegraders are built to meet any conditions — sand, clay or stony soil — curves and hills — banks and crowns — and there's a size for any job from 8 ft. to 24 ft. wide!

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Like
THIS?

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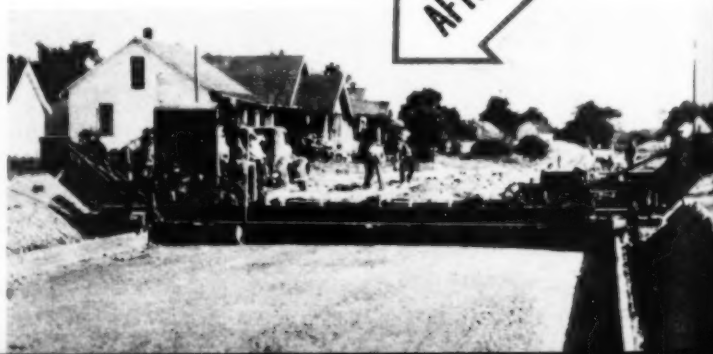
BEFORE

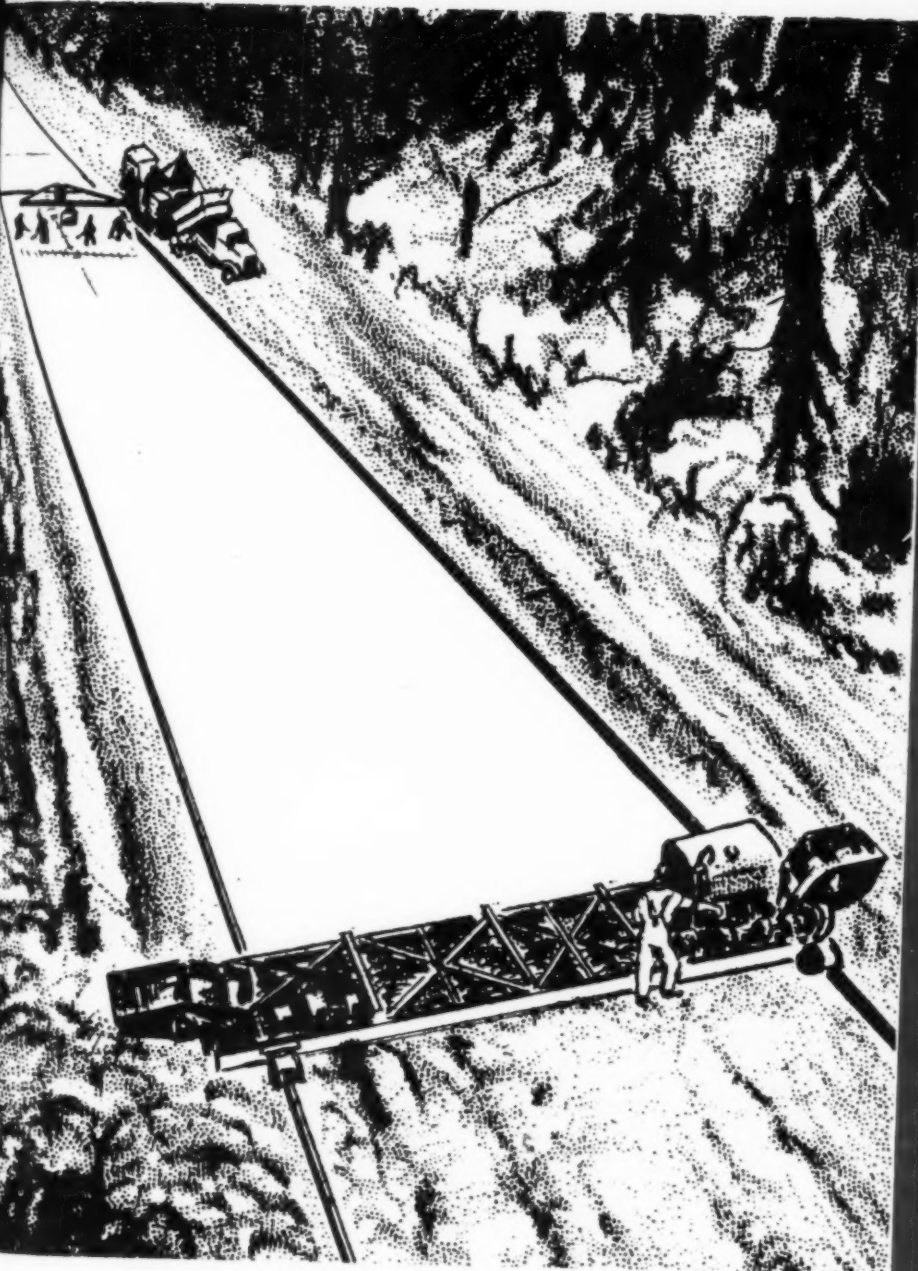
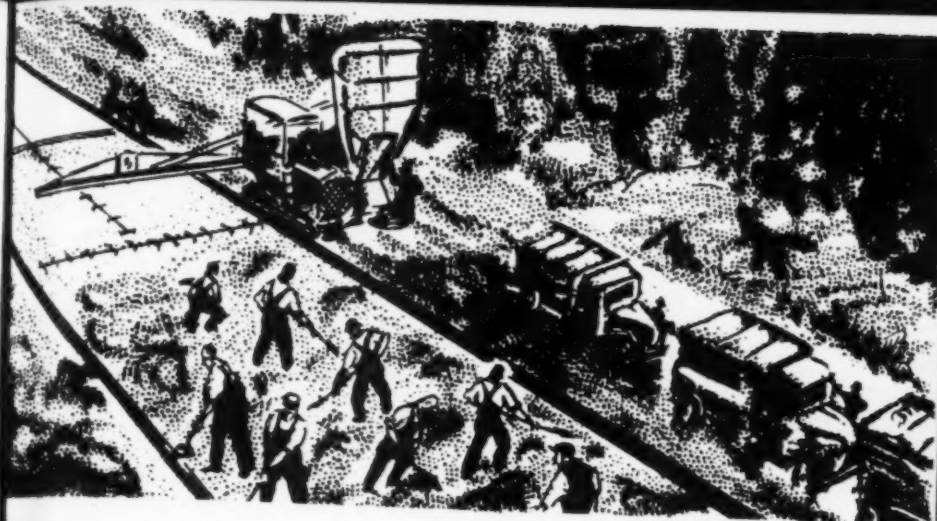


**LESS TIME
NEEDED FOR
ROUGH GRADING!**

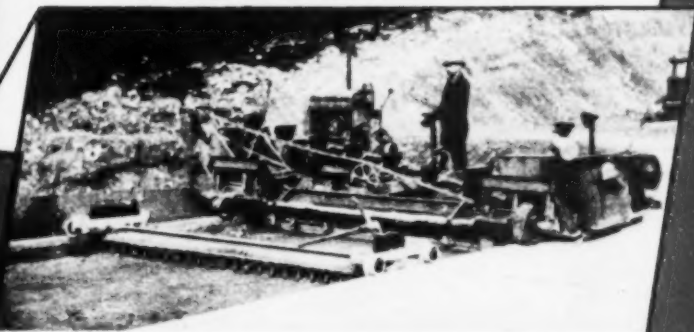
These pictures illustrate how little effort is required for preparing subgrade. Leave it ROUGH! The R-B Finegrader will cut it to specifications!

AFTER

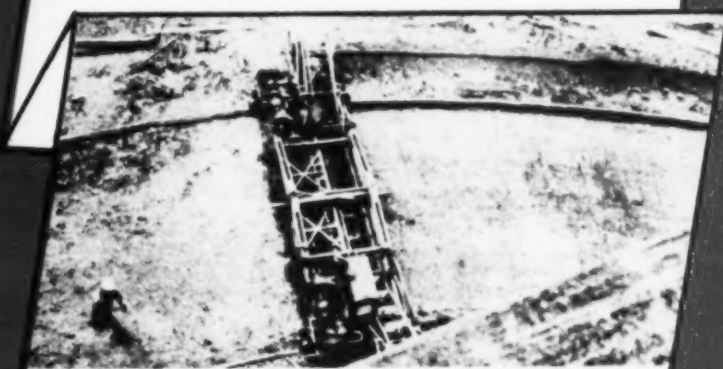




ON THE JOB WITH BUCKEYE R-B POWER FINEGRADERS!



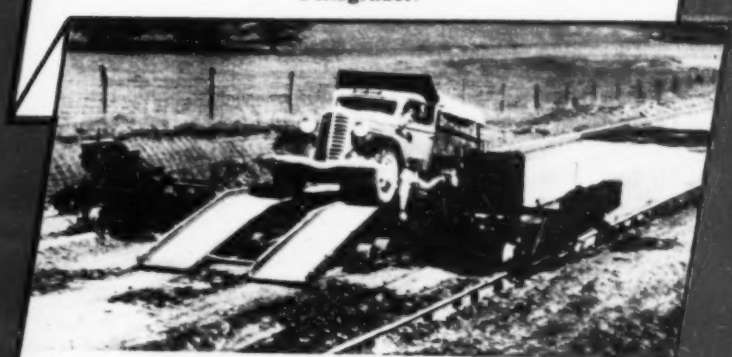
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Around curves! Buckeye R-B Power Finegraders will handle any job!



Uphill! It's no trouble with a Buckeye R-B Power Finegrader!



Up and over! R-B Finegrader with bridge for use where trucks ride on the grade.

Built by Buckeye

Convertible Shovels



Trenchers



Tractor Equipment



R-B Finegraders



Road Wideners



Spreaders





Mold Loft Building, California Shipbuilding Co., Los Angeles, Calif., constructed with Summerbell Teco timber trusses 116' clear span, 24' spacing prefabricated and erected by Summerbell Roof Structures, Los Angeles.

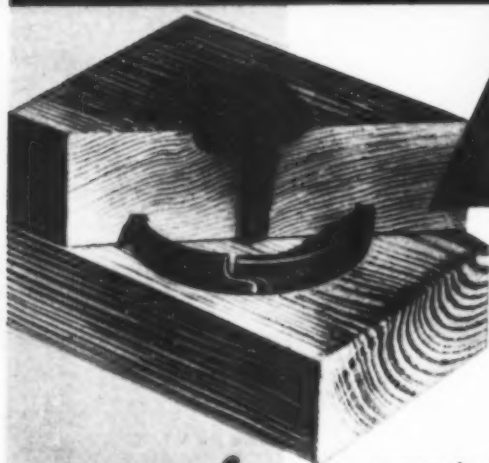
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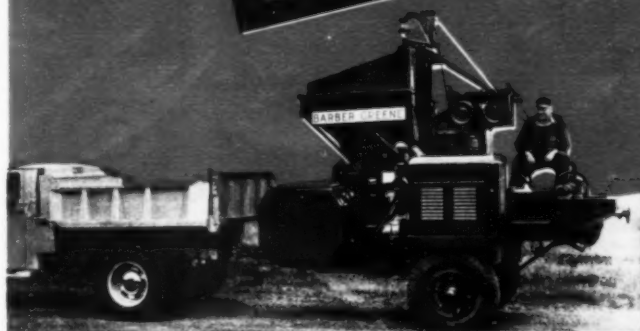
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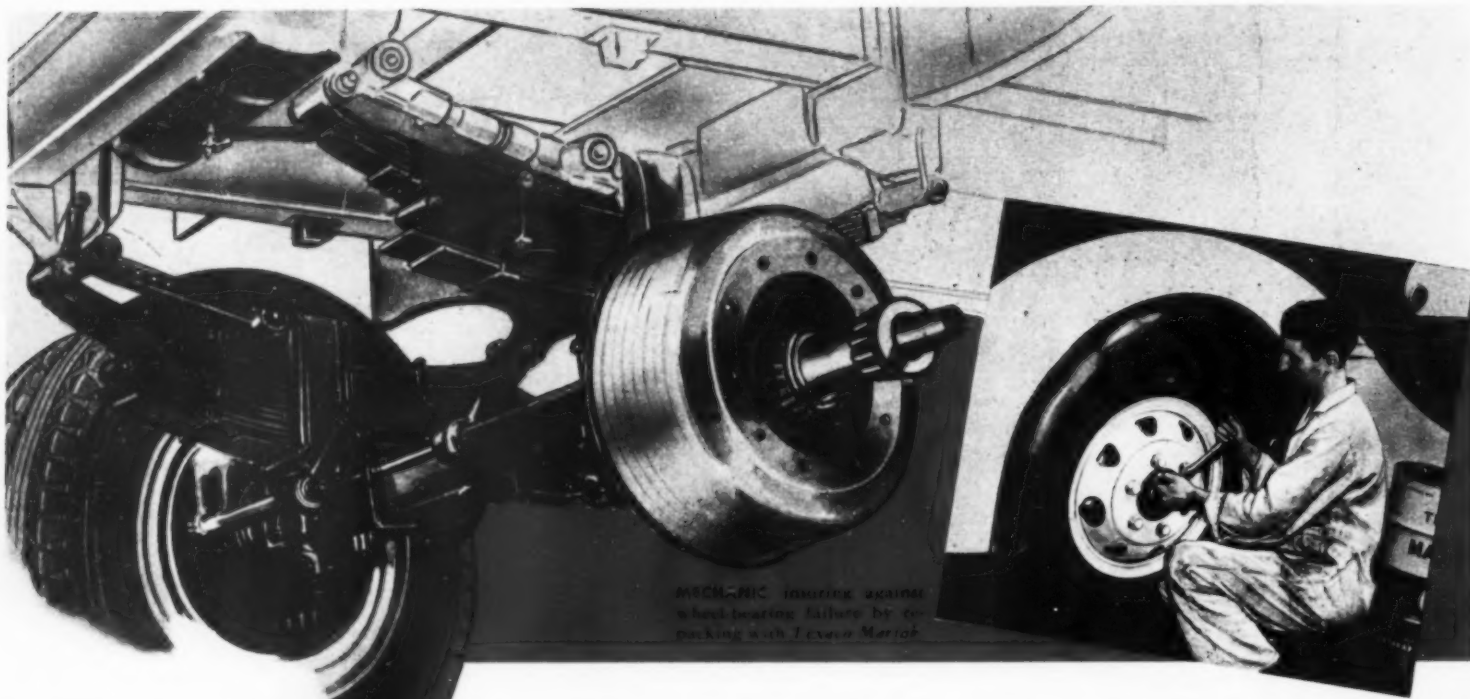
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41-4

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1941

TYPE "H" SETS A NEW PACE FOR FINISHING

100% Direct Control of Speeds, Screeds and Steering

THE HEAT'S BACK HERE

One Positive Movement Controls Any Function — Flip of Valve Lifts One or Both Screeds.

THE TRANSMISSION'S UP HERE

THE OPERATOR HERE

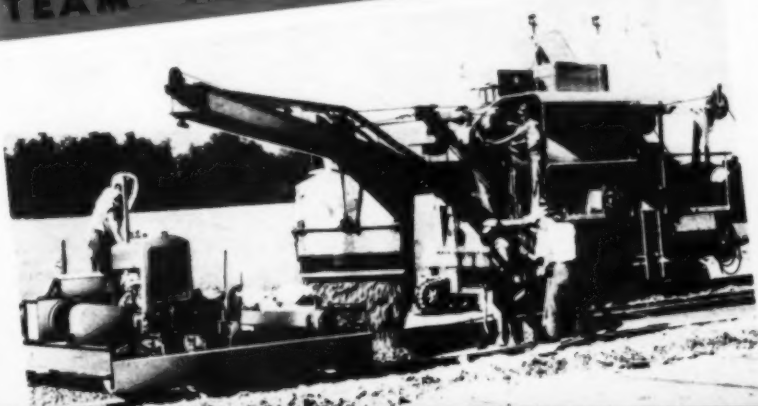
Jaeger now offers you a Finisher with the flexibility in speed and power, the ease and completeness of control demanded for the military-type road of tomorrow as well as the super-highway of today. Banked levers, *direct to transmission*, select any of 3 working speeds and 3 *independent* screed speeds, start, stop, reverse and steer. One flip of a hydraulic valve lifts either screed in 3 seconds. Capacity is equal to the biggest pavers on driest mixes. The "velvet touch" of its spring-cushioned screeds cuts floating and final hand work to a minimum. Has the fewest moving parts of any Finisher on market.

Send today for Specification F-41, describing Standard and Vibratory models with Quick Telescopic Width Changes, Single Central Transmission, Telescopic Transportation Unit that allows you to maneuver without removing front screed, many other advanced features.

TEAM YOUR FINISHER WITH A JAEGER SCREW SPREADER!

The mechanized method that built the Pennsylvania Turnpike. Lays all the concrete a 34E dual drum paver will produce (over 100 cu. yds. per hour of 1" to 1½" slump)—any standard width—speeds production, cuts costs behind any paver, large or small. The only Spreader equipped with Screw which positively re-mixes and densifies the material and compacts it well against the forms — **THE ONLY SPREADER THAT GUARANTEES AGAINST SEGREGATION** as proved by 10 years' use in numerous States.

Figure that one man with Spreader can do work of crew in pit and also strike off in front of Finisher. Paver can work at capacity and Finishing Machine can concentrate on producing a smoother finish. Here is a money-maker. Ask for actual figures.



THE JAEGER MACHINE CO., 800 Dublin Ave., COLUMBUS, OHIO

Now! The ATLAS Waterproof Galvanometer
can be had with a

LUMINOUS DIAL



Gives you an
Extra Hand at the Face!

Eliminates need for SPOTLIGHTING dial
while testing circuits underground.

•

Testing circuits at the face in the past almost seemed to call for a 3-handed wonder—two hands to handle the leg wires, and a third needed to hold the galvanometer, or to throw light on the galvanometer dial.

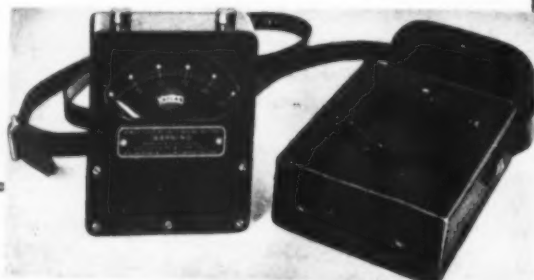
Now the new Atlas Waterproof Galvanometer ends that wild scramble—with a luminous dial and pointer as visible underground as in broad daylight.

It's surprising what a difference it makes—in economy and general efficiency. Experience shows that a face can be checked in half the time. One user reported he would gladly pay twice the small extra cost for the extra convenience.

Try this Galvanometer under actual operating conditions—in any degree of light or darkness. Then only can you fully appreciate the advantages of the new luminous dial. Only the man who tries one can know.

The New
ATLAS Waterproof Galvanometer
sets a new standard of accuracy and safety.

1. Waterproof and moisture-proof.
2. Non-corrosive Bakelite case.
3. 25% lighter—easier to handle.
4. High factor of safety—long cell life. Full scale deflection requires only 8 milliamperes of current.
5. Separate cell compartment—replacement of cell without breaking waterproof seal.
6. Dial read right side up through slot in case.



ATLAS

EXPLOSIVES
"Everything for Blasting"



ATLAS POWDER COMPANY, Wilmington, Del. • Offices in principal cities • Cable Address—Atpowco



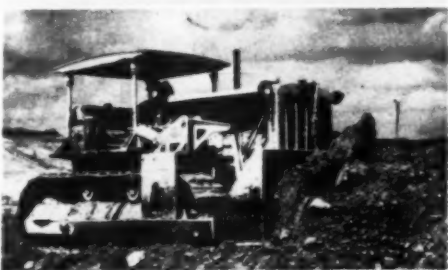
Forced ejection-type CARRIMOR SCRAPER. Available with cable control in four sizes, 12 yd. to 30 yd. capacities.

LA PLANT-CHOATE EARTH-MOVING EQUIPMENT

Designed and Built to Help YOU Make More Money!



Hydraulic TRAILBUILDER working on Indian Service road job in Oklahoma. Average haul is 200 to 250 feet.



"Caterpillar" Diesel D8 tractor with LaPlant-Choate Bulldozer at work on dam project, Whitney Point, N. Y.

**MADE EXCLUSIVELY FOR USE
WITH CATERPILLAR TRACTORS...**

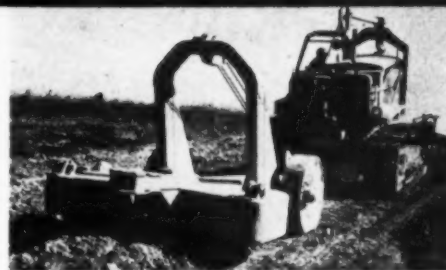
**recognized as the world's greatest
tractor power units!**

● In the many big construction jobs which are in immediate prospect, there is no room for inefficient equipment. The need is for highly versatile tools to do many jobs . . . quickly and at low cost.

Husky LaPlant-Choate equipment performs every job with peak efficiency and greatest economy enabling you to complete work well within your most conservative estimate. Modernize now with world-famous LaPlant-Choate equipment that is designed exclusively for use with Caterpillar Track-type tractors.

Get full details from your nearest LaPlant-Choate and Caterpillar dealer or write to the LaPlant-Choate Manufacturing Company, Inc., Cedar Rapids, Iowa, for FREE literature.

*If you have an earth-moving job —
LaPlant-Choate builds equipment for
it, to save you time, money and effort.*



LaPlant-Choate RP82 Ripper working on part of 55 miles of road being constructed at Ft. Leonard Wood, Missouri.



TAMPERS in tandem doing roadwork west of Corpus Christi, Texas.

LA PLANT-CHOATE MANUFACTURING CO. Inc.

CEDAR RAPIDS, IOWA.



EARTH MOVING . . . LAND CLEARING . . . SNOW REMOVAL

Flammable Canvas Again Responsible



36

Fire at Arverne Razes 9 Homes, Kills Resident

32 Buildings Are Damaged,
25 Persons Slightly Hurt
and Smoke Overcomes 3

A fire which started at 1 a. m. yesterday at Beach Channel Drive and Beach Seventy-fifth Street, Arverne, Queens, and quickly spread to houses in the vicinity, damaged thirty-two buildings and cost the life of one man. Nine of the damaged buildings, dwellings, were destroyed.

loss at \$100,000.

The blaze was discovered in the oil-soaked tarpaulins protecting the wooden frame work around concrete stanchions, which will support the overpass of the Far Rockaway branch of the Long Island Railroad when the structure is completed. The railroad right of way crosses Beach Channel Drive at Beach Seventy-sixth Street. Sparks from the canvas and the wood they covered were carried by the wind to nearby structures.

Death, Injury, \$100,000 Loss. . . . Another disastrous fire spread by oil-soaked tarpaulins used in building construction.

For a few cents more per yard, these tarpaulins could have been made of FIRE CHIEF Finished Duck — the permanent fire-resisting finish that won't wash out — and this needless loss of life and property could have been prevented.

Wherever flammable canvas presents a fire hazard — indoors or out — from welding sparks, hot rivets, workmen's torches, carelessly thrown cigarettes and matches, or other causes, FIRE CHIEF treated Duck assures safety.

Approved by both the Underwriters Laboratories and the Associated Factory Mutual Fire Insurance Companies, and meets all Government requirements.

WM. E. HOOPER & SONS CO.

New York PHILADELPHIA Chicago
Mills: WOODBERRY, BALTIMORE, MD.

FIRE CHIEF

The Finish That WON'T WASH OUT

The NEW Model 71

NORTHWEST
BUILT ESPECIALLY
FOR TODAY'S STEEL
SETTING PROBLEMS!

ITS big, powerful—40 tons capacity—yet easily handled, easily maneuvered to any part of the job, and it loads itself on one flat car. Unusual versatility is made possible by various drum and boom hoist combinations that will take care of any steel handling job. The Model 71 can be equipped with either two or three live drums in addition to either a high speed or low speed worm boom hoist, or one of the main drums can be rigged as a "live boom hoist."

A flange connected boom in conjunction with a Boom Hoist Bridle and Pendant lines make boom length changes easy without re-reeving cables. A hammer head design of the boom head permits high lifts without fouling the boom and a roof transom over the operator gives a clear view of all operations, even with the boom at its highest point. Before buying a steel erection, or heavy lifting crane, investigate this new Northwest.

NORTHWEST

NORTHWEST ENGINEERING CO., 1728 Steger Bldg., 28 E. Jackson Blvd., Chicago, Ill.



THEY BEAT BY ONE



THE PROJECT—flood control (levee building). The size—2,800,000 yards. The time limit—eighteen months. Yet, in SIX months, instead of eighteen, the job was completely finished.

Where was this record made—and when—and by whom—and with what? Right along the Ohio—only last fall and winter—by astute contractors Marsch, Peterson & Walker . . . the track-type tractor equipment on the job was 100% "Caterpillar."

What does it prove? That dirt sure moves when you've got the power and sturdiness of "Caterpillar" Diesel Tractors putting big-capacity excavating-and-hauling equipment through its paces.

What makes the achievement all the more extraordinary is the fact that conditions were not all "milk and honey" for the contractors. They had plenty of

rain which usually means delays . . . days of heavy going through thick mud . . . thousands of yards of sticky river-bottom gumbo to move.

But "Caterpillar" Diesel Tractors are mobile power-plants that can both "take it" and "dish it out"! There's strength and stamina in their rugged, compact design . . . quality material in every part . . . sure grip in their broad, deep-grousered tracks which enable them to get out there and on with the work under all kinds of weather or soil conditions. . . . There's dependability in their advanced Diesel engines that means steady full-powered performance for long, long stretches—with minimum time-out for servicing or parts replacements. "Caterpillar" Diesel Tractors get the work done!

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS



PILE IT ON!—the "Caterpillar" Diesel can move it! This D8 is handling a heavily loaded 33-yard LaPlant-Choate Carrimor scraper—working on the project mentioned in text.

"Caterpillar" Diesel Tractors are thoroughly armed against such time and life destroying enemies as water, mud, dust, grit, wear and stress

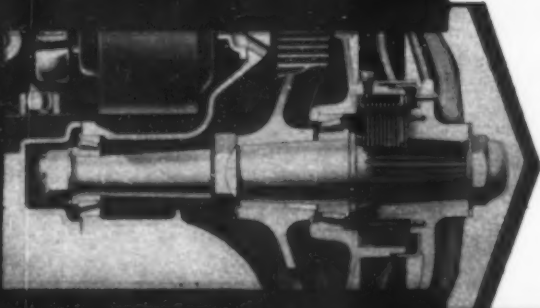
"Caterpillar" Diesel Tractors abound with advanced features for greater power, matchless fuel economy, maximum life and trouble-free operation.

"Hi-Electro" hardened crankshafts, cylinder liners and track pins; dual cooling—of engine and lubricating oil; air, oil and fuel filters; superior fuel system; dust-and-dirt seals . . . these are just a few. All have contributed to the record made on the earth-

moving project mentioned on these pages. See how, for instance, rain and mud were made less of a problem through "Caterpillar" bellows seals (left).

They guard the final drive. . . . Water, dust and mud are kept out; lubricant stays in. There is no compromise. . . . Wear due to foreign elements is licked!

"Caterpillar" bellows seals adjust, align, lubricate themselves; require no attention.



THE DEADLINE FULL YEAR!



ONE HUNDRED PER CENT "CATERPILLAR" DIESEL (15 units) was the tractor equipment used on this 2½-million-yard Ohio River levee construction. Scrapers shown are LaPlant-Choate Carrimors (three of nine of this make used on this project).

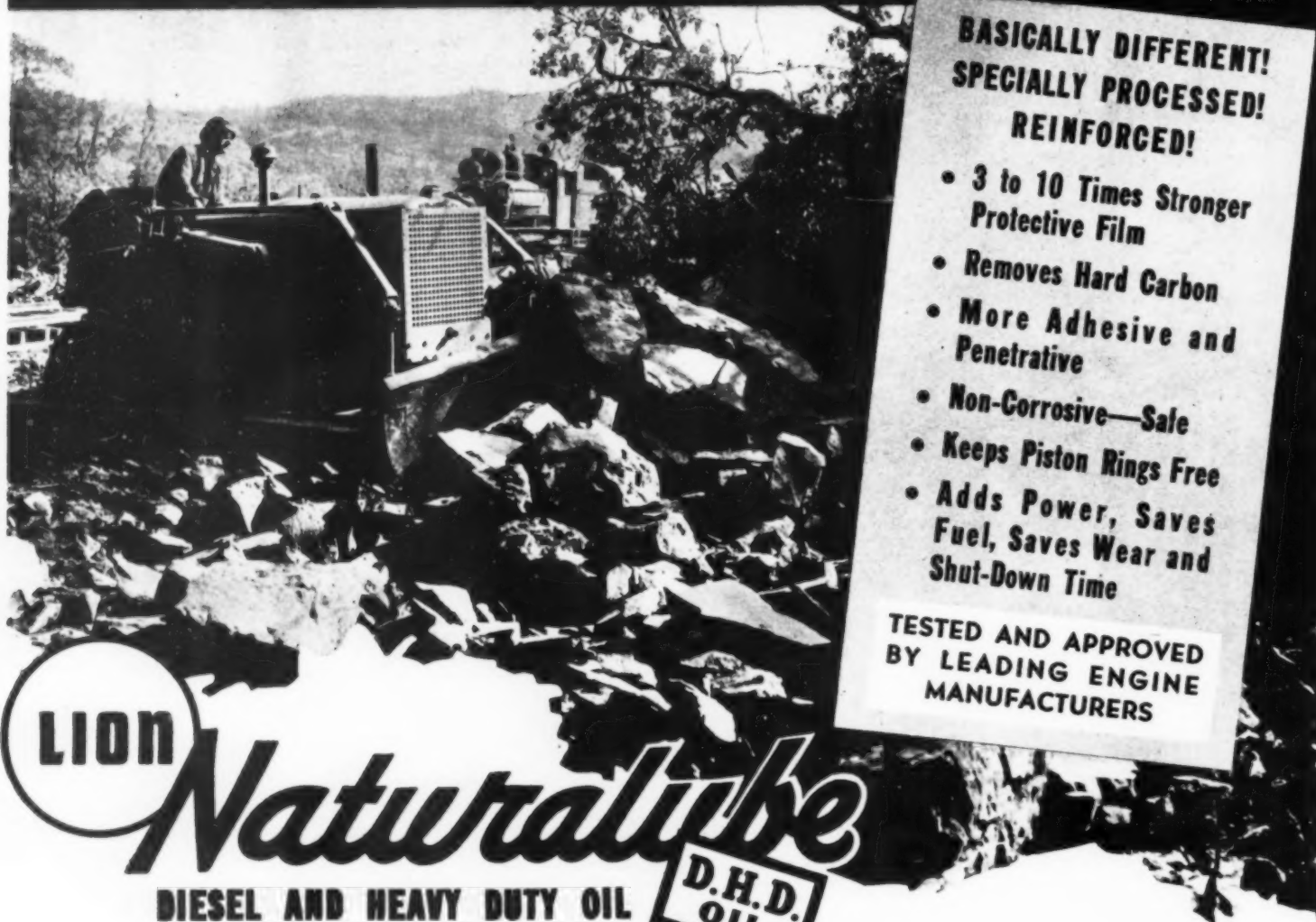
CATERPILLAR

DIESEL TRACK-TYPE TRACTORS • ROAD MACHINERY • ENGINES AND ELECTRIC SETS

Backed by the most complete and readily available parts-and-service facilities of their kind in the world!

NEW, IMPROVED SUPER-LUBRICANT

FOR TOUGHEST LUBRICATION JOBS



**BASICALLY DIFFERENT!
SPECIALLY PROCESSED!
REINFORCED!**

- 3 to 10 Times Stronger Protective Film
- Removes Hard Carbon
- More Adhesive and Penetrative
- Non-Corrosive—Safe
- Keeps Piston Rings Free
- Adds Power, Saves Fuel, Saves Wear and Shut-Down Time

**TESTED AND APPROVED
BY LEADING ENGINE
MANUFACTURERS**

LION

Naturalube

DIESEL AND HEAVY DUTY OIL

**D.H.D.
OIL**

Naturalube D. H. D. is made from a rare and basically different crude oil which imparts to the finished product a 3 to 10 times stronger protective film . . . greater adhesiveness and penetrativeness . . . and ability to remove hard carbon deposits. By special processing, Naturalube D. H. D. is reinforced or fortified to resist the deteriorating effects of extreme heat and oxidation. Results — engines are cleaner; rings and valves operate more freely for longer periods; no clogging of filters, screens or oil lines (i.e. clogging attributable to oil). There is no hard-carbon scuffing; general engine performance is greatly improved; operating and maintenance costs are lower; shut-down time is minimized. D. H. D. is non-corrosive — safe. It saves wear, adds power and saves fuel. Try D. H. D.—Your money back if you don't believe it to be the *best* oil you ever used!

Write for free brochure "New Type Lubricating Oils" containing proof of Naturalube's money-saving properties and details of money-back guarantee. Address Advertising Dept., Lion Oil Refining Company, El Dorado, Ark.



Made by **LION OIL REFINING COMPANY, El Dorado, Arkansas**

Here's why **HEIL TWIN-CABLE SCOOPS UNLOAD FASTER—CLEANER—AND SAVE YOU MONEY ON CABLE REPLACEMENT COSTS!**

HEIL Tilting Floor Positive Push-Out Action exerts lower line pull on the discharge cable

Heil CABLE CONTROLLED SCRAPERS unload faster and save you money — by eliminating the time lost during gear shifting that is required for unloading other cable scrapers. When the operator drives onto the fill, he dumps the load at hauling speed — without the necessity of gear shifting — because the low line pull required to operate the

Tilting Floor Push Out mechanism does not stall the tractor motor.

The tilting floor, hinged back of the cutting blade, sweeps sides and curved back end of the bowl clean as it dumps and pushes the load out of the bowl. The lever action which tilts the floor is a "generated" movement, starting with a low cable draft when the bowl is fully loaded and has a rapidly accelerating movement until the full dumping position is reached. Lower line pull is easier on cables — and saves you money on cable replacement costs!

Heil Twin-Cable Scoops are available in 6, 8, 10, 12, 16, and 24 Yard capacities for use with any make of crawler tractor. Faster, easier unloading action is only one of the reasons for increased hourly yardage production and lower operating costs. Write, today, for full details.

(This is the First Advertisement in a Series. Watch for others explaining additional operating advantages of Heil Twin-Cable-Scoops.)

TILTING a load requires less effort than **PUSHING** it



THE HEIL CO.
Milwaukee, Wisconsin • Millside, New Jersey



Heil Twin-Cable Scoops load and dump quickly and easily



Heil Hydraulic Dig-N-Carry Scoops pay out in long-time, low-cost service



Heil Hydraulic Bulldozers are built for all Cleveland Tractor Models



Heil Hydraulic Dump Units. Fast-operating — Rugged — Powerful

IT'S AN "ALL OUT" JOB FOR SHOVELS AND CRANES, TOO!

Jefferson Proving Grounds,
Madison, Ind.—2 Lorains

Indiana Ordnance Works,
Charlestown, Ind.—
10 Lorains

Camp Davis, N. C.

General Supply Depot,
Conley, Ga.

• A pasture becomes an air field almost overnight—an army camp with all the facilities of a small city springs up like magic—huge government arsenals and scores of private plants, which were in the blue print stage a few months ago, are either now in service or fast nearing completion. That's the American way at work, but it calls for moving millions of yards of rock and material, and thousands of tons of steel—and that means a tremendous amount of shovel and crane equipment.

Lorains are in the thick of the defense program. From Trinidad and Bermuda to Alaska, these machines are doing their bit to help contractors meet or beat construction schedules. And the list of projects is increasing daily almost as fast as machines move off the assembly line.

speed to deliver the goods. It's a difficult task, at best, and we ask your tolerance and cooperation. If "America First" is to be more than a slogan, we must deliver equipment for America's defense *first and fast*.

Thew-Lorain is operating at top

THE THEW SHOVEL COMPANY
LORAIN, OHIO

$\frac{3}{8}$ to $2\frac{1}{2}$ YD.

LORAINS



Iowa Ordnance Plant,
Burlington, Iowa—
A. Guthrie & Co., Inc.
and Al. Johnson
Const. Co.—9 Lorains

Fort Knox, Ky.

Jefferson
Barracks,
Mo.

New Douglas Aircraft
Plant, Calif.

Chorillo Reservoir,
Panama Canal Zone

Ravenna Ordnance Plant,
Ravenna, Ohio
Hunkin-Conkey Const. Co.
28 Lorains

LORAINS



NEW!

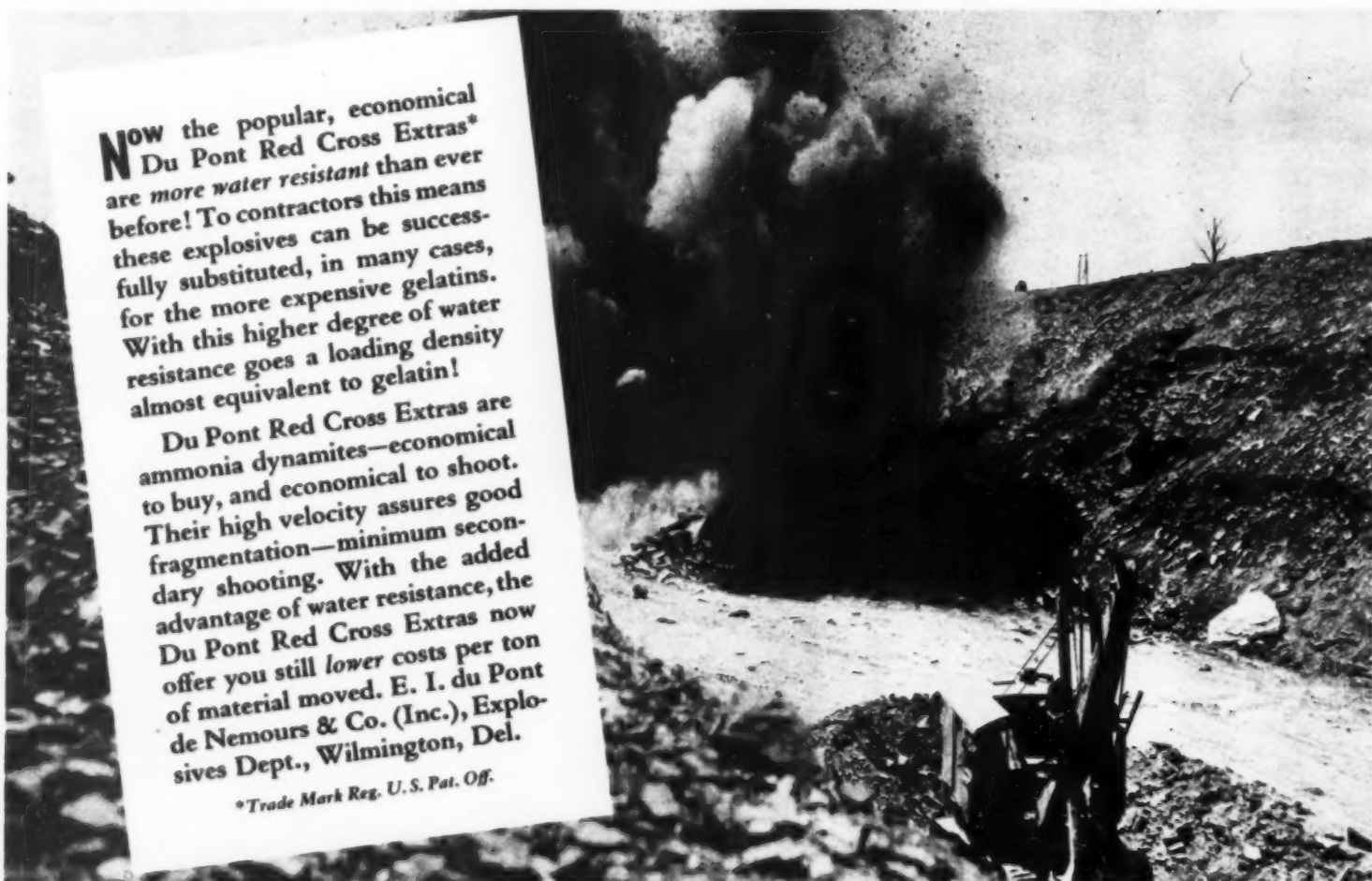
Red Cross Extras NOW MORE WATER RESISTANT!

Another Du Pont development to help reduce your blasting costs

Now the popular, economical Du Pont Red Cross Extras* are more water resistant than ever before! To contractors this means these explosives can be successfully substituted, in many cases, for the more expensive gelatins. With this higher degree of water resistance goes a loading density almost equivalent to gelatin!

Du Pont Red Cross Extras are ammonia dynamites—economical to buy, and economical to shoot. Their high velocity assures good fragmentation—minimum secondary shooting. With the added advantage of water resistance, the Du Pont Red Cross Extras now offer you still lower costs per ton of material moved. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington, Del.

*Trade Mark Reg. U. S. Pat. Off.



DU PONT

EXPLOSIVES

and **BLASTING
ACCESSORIES**

Come To

BLAW-KNOX

for

BUCKETS

Blaw-Knox, the most progressive designer and manufacturer of clamshell buckets... offers bucket users the widest possible range of types and capacities in buckets specialized in application for the job.

Blaw-Knox Bucket Catalogs convey complete information and contain tables showing dimensions and capacities, as well as illustrations of applications and details of design.

These catalogs show how to select the right bucket for the work.

Any or all of these Blaw-Knox Bucket Catalogs will be sent to you upon request. Write, or use the convenient coupon below.

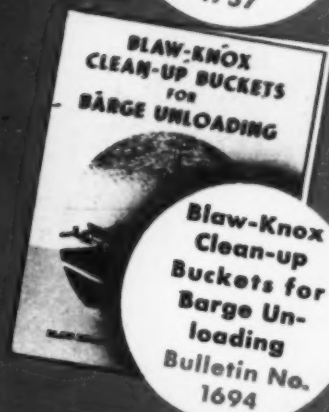
Blaw-Knox builds clamshell buckets in a wide range of capacities for all classes of work—dredging, ore handling, steel mill service, etc. Your inquiries are solicited.



**Blaw-Knox
Two-Line
Lever Arm
Buckets**
Catalog No.
1757



**Blaw-Knox
Buckets
for
Coal & Coke**
Bulletin No.
1807



**Blaw-Knox
Clean-up
Buckets for
Barge Un-
loading**
Bulletin No.
1694



**Blaw-Knox
Buckets
for Single
Drum
Hoists**
Catalog No.
1696



**Blaw-Knox
CONCRETE
BUCKETS**
Catalog No.
1816



**Blaw-Knox
Buckets
(4 Rope) for
Bridge Type
Cranes**
Bulletin No.
1496



**Blaw-Knox
Buckets for
FERTILIZER and
CHEMICAL
Plants**
Bulletin No.
1812



**Blaw-Knox
Pulpwood
Grapples**
Bulletin No.
1744



**Burtoning
with Blaw-
Knox Buckets**
Bulletin
1745

BLAW-KNOX CONSTRUCTION EQUIPMENT includes:
Shovels and Buckets... Road Forms... Street
Forms... Concrete Spreaders... Pumping
Towers... Vibrators... Concrete Buckets
... Clamshell Buckets... Truck Mixers...
Striping Machines... Turntables... Road
Finishers... Steel Forms.

BLAW-KNOX DIVISION of Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh, Pa.

Send me Blaw-Knox Bucket Catalogs Nos.

COMPANY _____

INDIVIDUAL _____

STREET ADDRESS _____

CITY _____

STATE _____

BEST SELLER BECAUSE IT'S THE BEST BUY

Year after year, more Chevrolets than any other make are chosen by America's truck buyers as the best buy in the highly competitive truck market. There could be no stronger endorsement of Chevrolet than this—that American business men deem it the best value, and *say it with orders.*

CHEVROLET MOTOR DIVISION, General Motors Sales Corporation, DETROIT, MICHIGAN

FEATURES

★ TWO NEW VALVE-IN-HEAD ENGINES . . . STANDARD: 174 FOOT-POUNDS OF TORQUE—90 HORSE-POWER . . . "LOAD-MASTER": 192 FOOT-POUNDS OF TORQUE—93 HORSEPOWER* ★ NEW RECIRCULATING BALL-BEARING STEERING GEAR ★ NEW, MORE COMFORTABLE DRIVER'S COMPARTMENT

*Optional on Heavy Duty models at extra cost.

60 MODELS

ON NINE LONGER WHEELBASES . . . A COMPLETE LINE FOR ALL LINES OF BUSINESS



CHEVROLET

IMPORTANT TO OPERATORS OF DIESEL-POWERED FLEETS

● With the rapidly increasing use of Diesel power on all types of fleets, maintenance men are finding a new set of problems. For a number of years Standard Oil has maintained a staff of experienced Automotive Engineers throughout the Middle West. Their sole object has been to see that fleet operators take full advantage of the economy afforded by Standard Oil automotive fuels and lubricants. These Engineers are also thoroughly familiar with Diesel engine operation. They are trained and equipped to analyze fuel and lubricant requirements, to locate causes of inefficient operation, and to help you make full use of the economy of Diesel operation.

Regardless of the type of equipment you operate you'll find their service helpful in many ways.



CONTRACTORS FIND S. O. ENGINEERS HELP AVOID DELAYS

Diesel-powered construction equipment is not new. Standard Oil Engineers have had many opportunities to work with maintenance men on contractors' equipment and highway department fleets. Their recommendations on Diesel fuel selection and methods of handling it, have eliminated costly fuel pump and injector maintenance problems. On many fleets, their suggestions have made it possible to correct mechanical trouble before equipment is tied up on the job where repairs are costly and difficult to make.



OIL CONSUMPTION CUT 30% ON DIESEL TRUCKS...

Just one example of many instances in which truck operators have benefited by Standard Oil Engineering Service is covered by the statement from D. H. Mickelson, Superintendent of Fleet Maintenance at the Mutual Wholesale Food and Supply Company, Minneapolis, which follows:

"Before your Automotive Engineer came to us, we were experiencing considerable difficulty with our Diesel engine trucks. Exhausts were smoky, engines were sludged up, oil consumption was high and power output was erratic. We followed his recommendations and here are the results:

"Exhaust smoke became much lighter, the engines became free of sludge, oil consumption dropped thirty per cent and the power output of the engines stabilized and became normal."



DIESEL PROBLEMS SOLVED FOR BUS OPERATORS...

Because Standard Oil Engineers have had experience with equipment on which Diesel engines have been in use for some years, they can be of great help to bus maintenance men who have recently added Diesel-powered buses to their fleets. The conditions under which your buses operate may not be identical to those in other fleets, but these Engineers know Diesel engine characteristics and requirements. This experience has already proved valuable to many bus fleets.

You can reach a Standard Oil Automotive Engineer by writing Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago, Illinois. In Nebraska write Standard Oil Company of Nebraska at Omaha. Ask to have the Engineer nearest you call.

Copyright 1941, Standard Oil Company

STANDARD OIL COMPANY (INDIANA)
AUTOMOTIVE ENGINEERING SERVICE

LOWERS
MILEAGE
COSTS



SMOOTH AS CONCRETE FORMED AGAINST PLYFORM

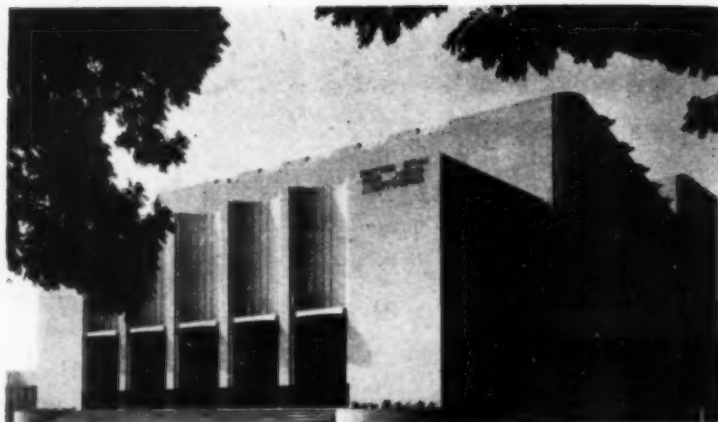
● When specifications call for smooth, flawless concrete surfaces, get them easily and at low cost with Plyform, the grade of Douglas Fir Plywood made especially for concrete forms.

Plyform is available in a variety of thicknesses—and in sizes up to 4' x 8' or even larger on special order. It is manufactured in strict accordance with U. S. Commercial Standard CS45-40 from special veneers and special highly water-resistant premium glues. Every panel is edge-sealed in distinctive silver green and oiled at the mill. Every panel is also stamped with the Plyform "grade trade-mark" to facilitate identification and specification.

Sheathing and Lining Combined

The thicker panels of Plyform are so rigid they serve as both sheathing and lining. They are easily erected and stripped. Plyform reduces rubbing and finishing to the absolute minimum. And when handled with reasonable care, it gives numerous re-uses.

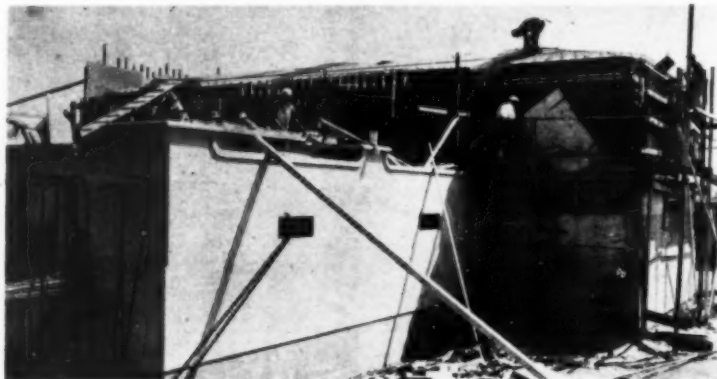
Get complete data on Plyform now. See how it will save you labor, time and money and produce better results. Write for free Concrete Form Booklet. Douglas Fir Plywood Association, Tacoma, Washington.



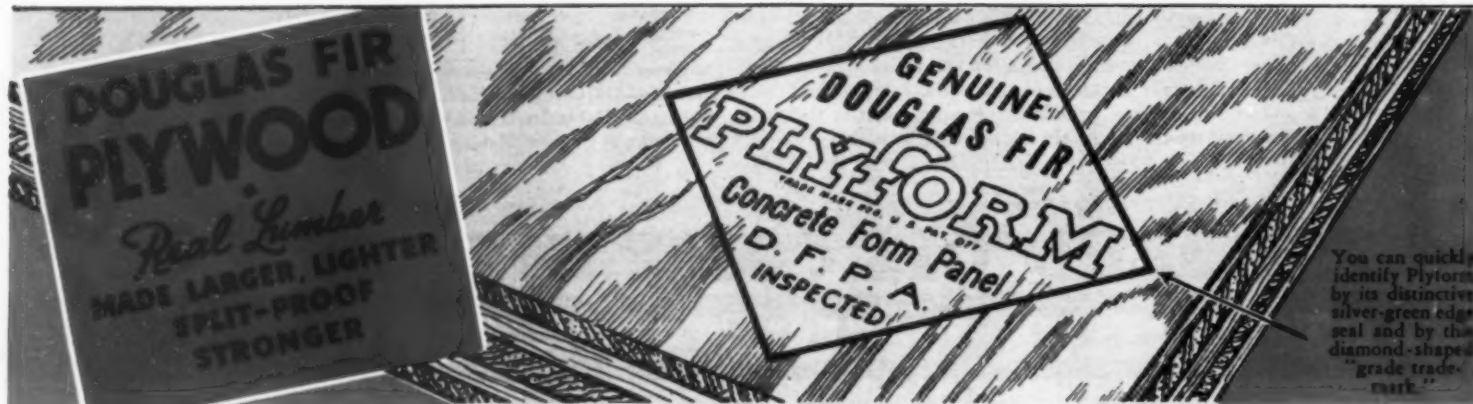
FOR THE HIGHEST TYPE OF ARCHITECTURAL CONCRETE The new Whittier Union High School in Whittier, Calif., is one of the most beautiful architectural concrete buildings in the nation. The flush, unblemished surfaces were formed against satin-smooth, rigid, labor-saving Plyform.



EVEN THE BACK LOOKS GOOD! This rear view of the Whittier Union High School is strikingly beautiful, too... proving that when Plyform is used, all surfaces can be flawless. Wm. H. Harrison was the architect for this school; J. K. Thomas, the contractor.



FOR MAXIMUM RE-USES! The concrete in this filter station of the Metropolitan Water District in San Dimas, Calif., is being formed against the exterior type of Plyform because maximum re-uses were desired. EXT-DFPA Concrete Form Panels have proven they can be re-used as many as 50 times!



You can quickly identify Plyform by its distinctive silver-green edge seal and by this diamond-shaped "grade trade-mark."



—PROVED BY **P&H**

You can't ignore the facts! The owners of more than 1700 P&H's have proved the extra strength of these rolled alloy steels — on the toughest kinds of excavating work.

Naturally, this better, all-welded construction will be more widely used in the years ahead. Although its adoption is coming by gradual steps in the industry, P&H is the only excavator with upper and lower structures built entirely of these tough rolled steels.

S-M-O-O-T-H as steam — P&H's new hydraulic control.



General Offices: 4494 West National Avenue, Milwaukee, Wisconsin

HARNISCHFEGER CORPORATION

EXCAVATORS • ELECTRIC CRANES • ARC WELDERS



HOISTS • WELDING ELECTRODES • MOTORS

1700
~~**1600**~~

OF THE TOUGHEST
EXCAVATORS EVER
BUILT — THAT'S P&H
ROLLED STEEL DESIGN

Another way you profit
with Bethlehem Road
Steel Service.



You'll speed up work!

When you order road steel from Bethlehem, work that's started goes along at a profitable clip. Working crews don't have to stand idle waiting for some key item to arrive, some material that's gone astray. Why is this?

Because Bethlehem handles orders for road steel as a single unit, plans shipments to meet your own working schedule, does its part to keep construction

moving at a smooth, profitable pace. That smooth pace is a mighty big factor in getting jobs finished on time. Furthermore, Bethlehem Road Steel Service enables you to eliminate needless correspondence, extra phone calls, bookkeeping, accounting. And you are sure that each item of road steel you get is outstanding in design and quality.

BETHLEHEM STEEL COMPANY





GENERAL

gives you more of the things necessary to maintain high production, as it is doing here for Hannaman & Burroughs of Salisbury, Md. The machine is unloading stone at Berlin, Md., for a new road near Ocean City.

MORE ROCK— MORE HIGHWAYS

This GENERAL Model 307 Clamshell Crane is going right down the line of cars, keeping trucks and cars on the move.

Let the GENERAL help you keep material on the move.

The OSGOOD COMPANY

Sizes: $\frac{1}{2}$ to $2\frac{1}{2}$ Cu. Yd.
Diesel - Oil - Gas - Electric

Associated with
The GENERAL
EXCAVATOR CO.

The HERCULES COMPANY

HERCULES
IRONEROLLERS
6 to 12 Tons
Diesel or Gasoline

Associated with
The GENERAL
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GENERAL

Sizes:

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Diesel—Gas—Electric



SHOVELS

DRAGLINES - CRANES
Crawler & Wheel Mounted

THE GENERAL EXCAVATOR COMPANY, Marion, Ohio

VENTUBE* IS PRE-TESTED

↓ **HERE** FOR EXTRA YEARS **HERE** ↓
OF SERVICE



NO WONDER "Ventube" flexible ventilating duct is so amazingly durable! It is made of only the finest extra-heavy, long fibered cloth woven to specific standards set up by the Du Pont testing laboratories. The fabric and even the thread that goes into the making of "Ventube" are then processed with a special chemical treatment to resist fungus growth. Next, this fabric is impregnated and then coated with a resilient composition on both sides to resist acid water, gases and moisture!

Rigid chemical control and high Du Pont standards assure you of getting the best ventilating results

possible with "Ventube." It is balanced in strength in both the warp and the filler direction so it can withstand tearing and rupture. It is light-weight, flexible, and easy to handle. "Ventube" slides back quickly when blasting. Immediately afterwards it slides forward again, bringing clean, fresh air into your tunnel with only the aid of a motor-driven fan of proper capacity.

"Ventube" saves time . . . helps you speed up work and cut costs. Install a few sections in your toughest working. See for yourself how efficiently it works. We'll be glad to send you facts and figures. Write to-day for complete information!



E. I. DU PONT DE NEMOURS & COMPANY (INC.)
"FABRIKOID" DIVISION • FAIRFIELD, CONN.

"VENTUBE" is Du Pont's registered trade mark designating its rubber impregnated flexible ventilating duct.

THE FLEXIBLE VENTILATING DUCT

● This roomy, compact powder bag is made of the same sturdy material as is "Ventube." The seams are sewed as tough as rawhide—and the fabric is coated and impregnated with thick, resistant rubber. Du Pont powder bags are available in several sizes. Write for sizes and prices.



MORE FEET OF HOLE PER SHIFT
EASIER HOLDING
LOWER UP-KEEP COST



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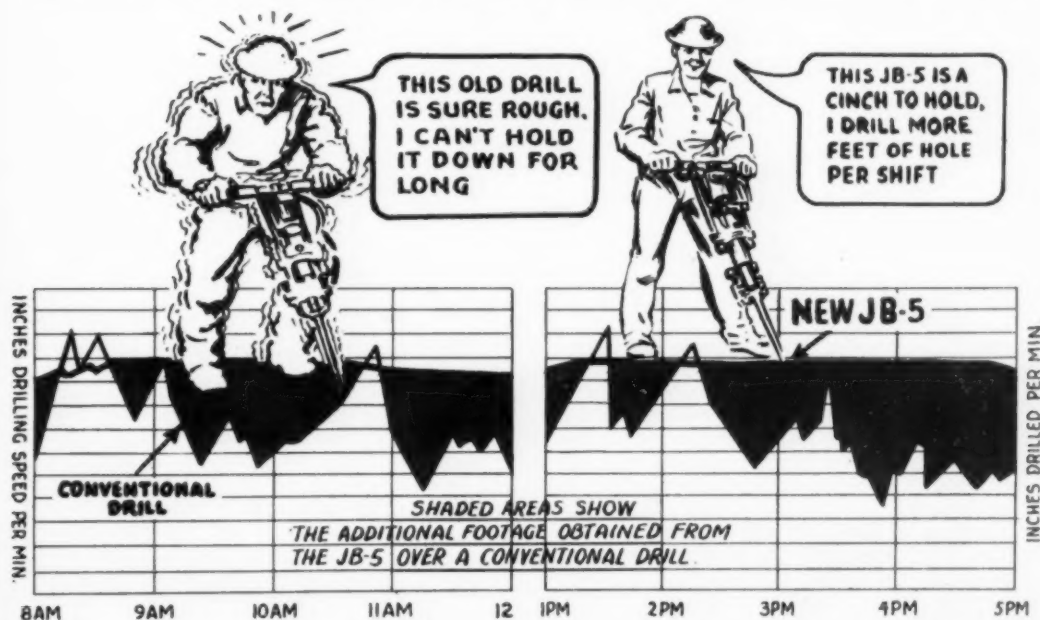
The **JB-5**

A NEW 55 LB. JACKHAMER

THE Jackhamer is a hand held drill. In operating it, human arms, legs and backs become the mounting—thus a man's size and strength limit the drilling capacity.

In the past, few operators had the strength and endurance needed for top performance of a 55 lb. class hammer throughout the shift. The result was less drilling, excessive fatigue and high upkeep costs.

Today's new Jackhamer, the JB-5 is so designed that the average size man can comfortably handle its full power all day long producing more feet of hole per shift with less upkeep costs. Send for Bulletin No. 2734.

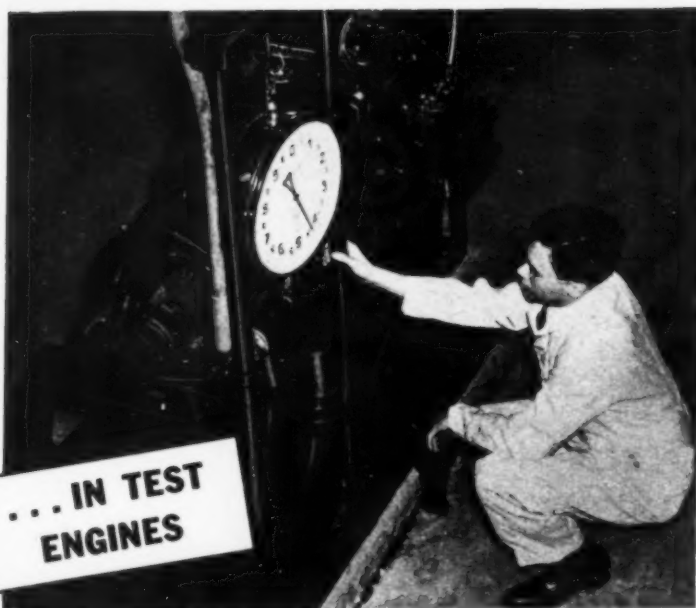


8 HOURS DRILLING SHIFT

PROVED!



... IN THE
LABORATORY



... IN TEST
ENGINES



... IN THE
TOUGHEST KIND
OF CONSTRUCTION
OPERATION

NEW SHELL RUDIS OIL

The Oil that
can take it



THAT'S the story of the new Shell Rudis Oil. Tests, made by competent, independent engine authorities, prove that the new Shell Rudis Oil...

1—Has high oxidation stability under

most severe temperature conditions.

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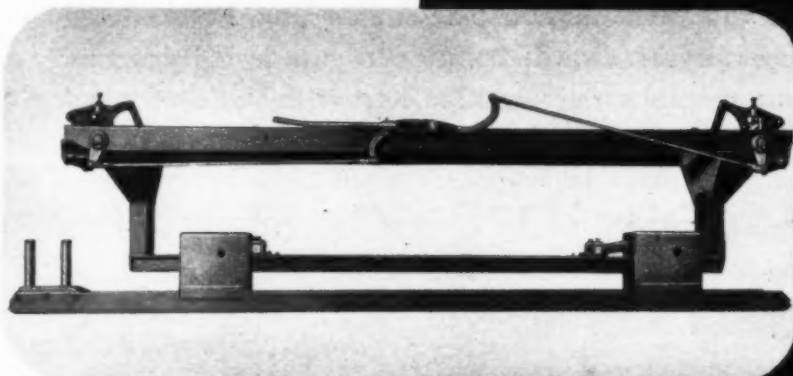
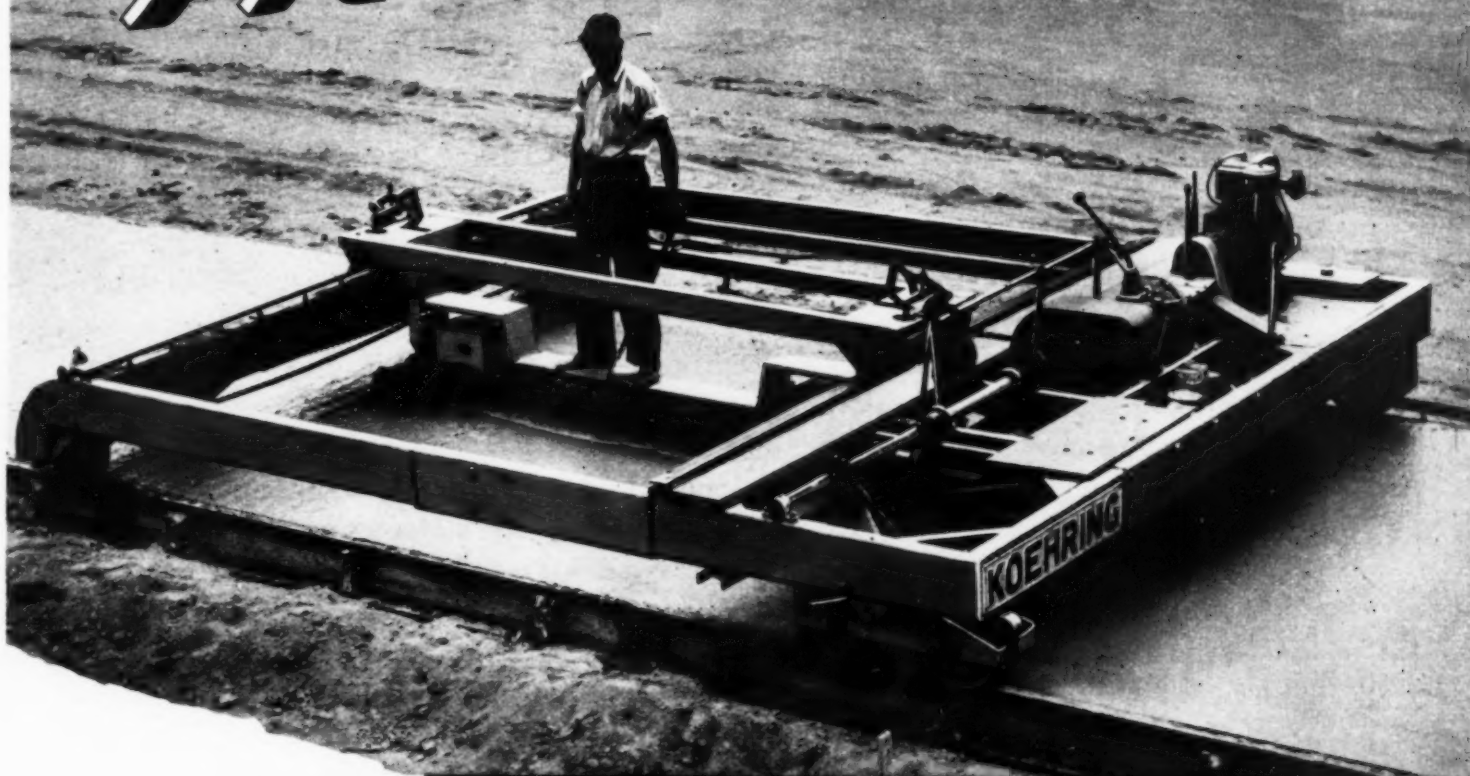
Try Shell Rudis Oil in your engines today.

NEW

SHELL RUDIS OIL

FOR HEAVY
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FINISH SLAB at PROPER TIME



Carriage and screed travel along specified crown as controlled by the carriage wheels on the template tracks. True contour of the slab is assured by this mechanical method. Slab thickness errors are quickly detected.



● Accurate Slab Finish Corrects Surface Errors

Operation of the Koehring Longitudinal Finisher is based on the theory that there is only one period when the slab finishing should occur. It is

the time after the initial set has taken place. Whether the concrete is easy or difficult to work the Koehring Finisher operates consistently and efficiently at any rate of speed to synchronize with paver production. Correct timing of the finishing operation is an outstanding advantage of the Koehring Finisher. Manual finishing is not always correctly timed because of the physical limitations of the manual method.

KOEHRING COMPANY • Milwaukee, Wis.

HEAVY-DUTY CONSTRUCTION EQUIPMENT

Replace WORN CABLE

ON YOUR SCRAPER EQUIPMENT

WITH "FLEX-SET" PREFORMED

YELLOW STRAND



A peg and its hole, a scraper and its cable . . . for each there is one best fit. And because pay loads move faster, more smoothly and at lower cost with "Flex-Set" Preformed Yellow Strand on the job, it's the "must have" choice of contractors and operators in ever-growing numbers.

When you replace worn wire rope with a new reel of free-running Yellow Strand, you get the specific size, length and construction engineered for your machines. You get the correct field-tested safety factor: proper balance between line pull and rope strength, to forestall costly shut-downs for machine repairs. Preforming supplies the limberness that makes handling easy . . . curtails kinking . . . prolongs rope life mightily by resisting metal fatigue.

On cable controlled equipment the cable itself is no place to experiment. Protect your investment by making sure that the rope you install has a yellow strand. Broderick & Bascom build it for you, combining the quality of finest drawn-to-order steel wire with the performance that comes from 65 years of concentration on wire rope applications. Our distributor in your locality stocks and gives quick service on your special scraper cable. Start with Yellow Strand . . . stay with Yellow Strand . . . for savings you can see and measure.

BRODERICK & BASCOM ROPE CO., ST. LOUIS

Branches: New York, Chicago, Houston, Portland, Seattle. Factories: St. Louis, Seattle, Peoria

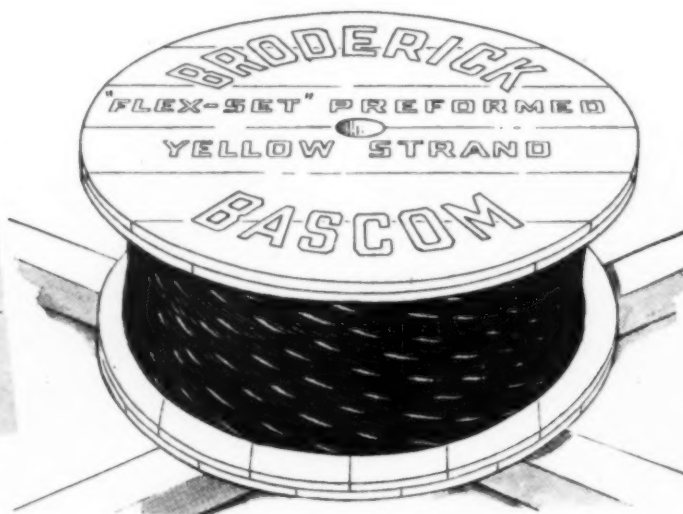
Distributors in All Industrial Centers

"PAY DIRT"

Yellow Strand helps keep pay yards and profits rolling: by requiring fewer cable changes . . . by taking the shocks that would otherwise damage vital parts and cause expensive delay. Accept no substitute for time-tried Yellow Strand "Flex-Set" Preformed Wire Rope on



ALL-PURPOSE SCRAPERS
'DOZERS • RIPPERS • CRANES
 And All Other Cable Controlled Equipment





INDIANTOWN GAP MILITARY RESERVATION, Penna. (Partial View) ☆ CONSULTING ENGINEERS: Gannet-Eastman-&Fleming Co., Harrisburg, Pa.
CONTRACTORS: W. F. Trimble & Sons Co., Pittsburgh, Pa., Ferguson & Edmondson Co., Pittsburgh, Pa., The Huffman-Wolfe Co., Columbus, Ohio
READY MIX CONCRETE: Pennsylvania Supply Co., Harrisburg, Pa.

When it's SPEED you want!

DEFENSE construction dictates the use of quick service concrete. At Indiantown Gap, for example, concrete walls and piers for the barracks, poured one day, were ready for use the next. Thanks to the use of Lehigh Early Strength Cement, this concrete was ready for service 3 to 5 times quicker than if normal cement had been employed.

In defense projects speed is a first

consideration. It so happens, however, that Lehigh Early Strength Cement effects speed *and* economies *wherever* put to work. You can count on it to shorten construction time, reduce overhead expense, cut forms cost, speed up work of other trades, avoid penalties, earn bonuses.

In addition to the advantages accruing from speed, Lehigh Early Strength Cement actually makes better, denser

concrete. The Lehigh Service Department will gladly answer your inquiries.

LEHIGH PORTLAND CEMENT CO.
Allentown, Pa. Chicago, Ill. Spokane, Wash.

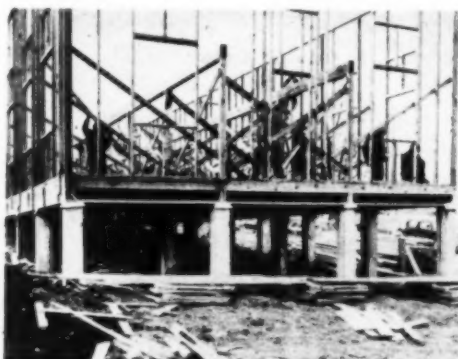
Lehigh

EARLY STRENGTH CEMENT

for service-strength concrete in a hurry



Pouring concrete for the 8" x 8" piers that support the barracks. Made with Lehigh Early Strength Cement.



Next day, thanks to the quick-curing Lehigh Early Strength Cement, piers are ready for next operation.



Some of the completed barracks, 400 in all, each now comfortably housing 63 soldiers.

Proved by two years' test on America's toughest rock jobs . . .

**THE NEW GOODYEAR
SUPER-SERVICE
HARD ROCK
LUG TIRE**

UP TO 30% MORE RUBBER
in the tread for longer wear

WIDER, LONGER, FLATTER LUG BARS
for greater traction and bruise protection

AT NO EXTRA COST!

On Pennsylvania Turnpike construction work, the new Goodyear Hard Rock Lug tire proved definitely superior.

Now ready in popular sizes including 18.00-24 is the finest rock tire Goodyear has ever built — a tire that has demonstrated its all-round toughness and longer life in two years' test service on the Pennsylvania Turnpike, Virginia's Skyline Drive, Washington's Mud Mountain Dam job, and in numerous strip mines.

It's the new Goodyear Hard Rock Lug tire — a heavier, tougher, sturdier successor to our famous Pneumatic Lug that long held all records in rock service.

This new Hard Rock Lug tire has upwards of 30% more rubber in the tread

— wider, longer and flatter lug bars — a carcass made of the best high tensile cord — *three great improvements that insure longer wear, still more ground contact area and far greater resistance to cutting and bruising.*

It's a bigger tire, built to maximum cross-section possible for rim sizes. Beads are heavier. New multiple com-

pounds give the strongest bond known between tread and carcass.

Yet with all these advances this new Goodyear Hard Rock Lug tire costs no more than ordinary special rock service tires, actually less on a ton mileage basis — *because it gives you far longer wear!* Your Goodyear dealer has it now.

THE GREATEST NAME  IN RUBBER

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

Construction Methods

ROBERT K. TOMLIN, Editor

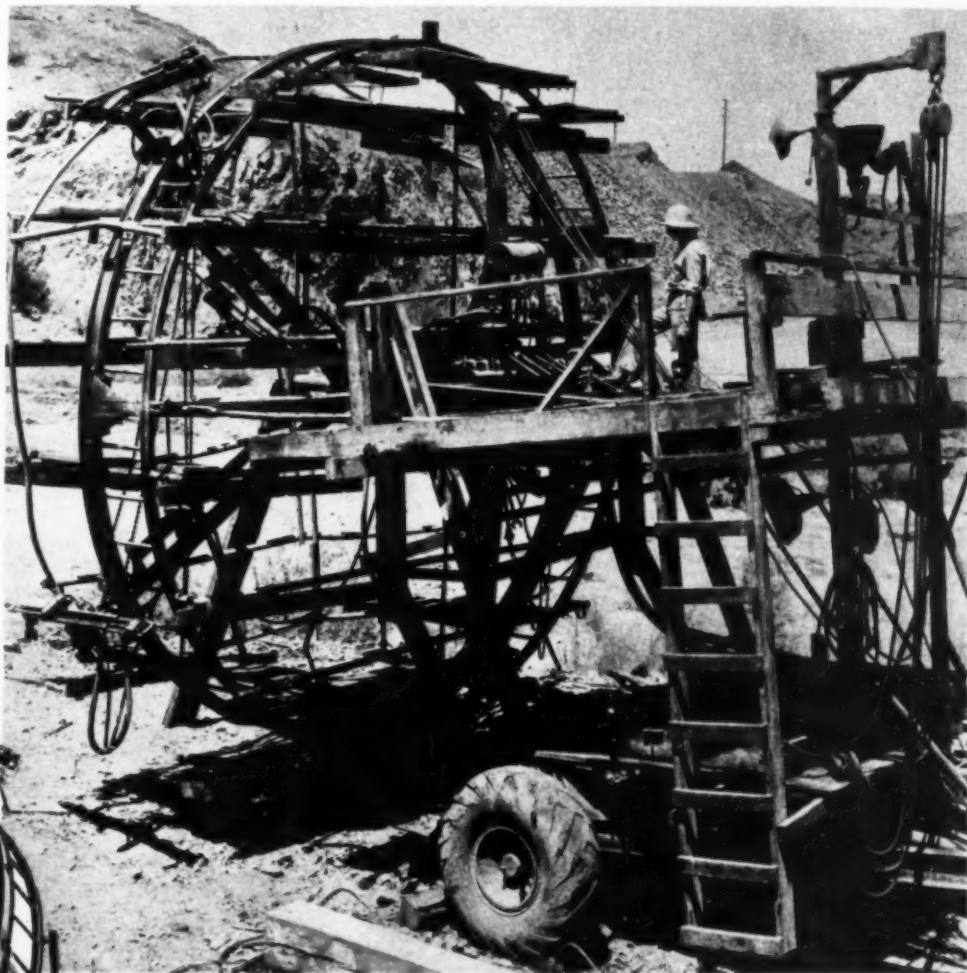
Volume 23

JUNE, 1941

Number 6

Circular Drill Jumbo Carries Six Drifters on Three Radial Arms

TILTING OF JUMBO makes it possible to adjust drilling position on tunnel grades and also facilitates movement of outfit back from face by tractor.



CIRCULAR DRILL JUMBO consists of 18 ft. 3-in. diameter ladder ring mounting six drills on three radial arms and wheel-mounted carriage carrying two platforms for drill steel, hose and other supplies.

TO FACILITATE ROCK DRILLING OPERATIONS on four 27-ft.-diameter penstock tunnels serving the powerhouse at Parker dam, U. S. Bureau of Reclamation structure on the Colorado River for diversion of water into California's Metropolitan Water District aqueduct, a circular drill jumbo, mounted on a two-wheel balloon-tired carriage, was designed and built by Clyde W. Wood, Los Angeles contractor, to carry six drifters on three adjustable radial arms. Features of the rig, illustrated herewith, are its mobility, ease of adjustment and ability to tilt to accommodate drilling for tunnels driven at grades of from 20 to 27 per cent.

The jumbo consists essentially of two parts, a drill-

(Continued on page 102)



FIRST MILLIONTH YARD OF CONCRETE (above and right) is placed by Pacific Constructors, Inc. May 3 in Shasta dam, U. S. Bureau of Reclamation project in California. Served by cableways from giant head tower concrete blocks of structure now rise in places 225 ft. above bedrock. Ultimately Shasta dam will have height of 560 ft.

SCROLL CASES (below) for two turbines at Fort Peck dam, U. S. Engineer Department project on Missouri River in Montana, are fabricated by S. Morgan Smith Co. and installed by Woods Bros. Construction Co. in powerhouse substructure. When heavy steel cases are aligned and riveted, they will be embedded in concrete which will extend 10 ft. above center line of each unit.



THIS MONTH'S NEWS REEL

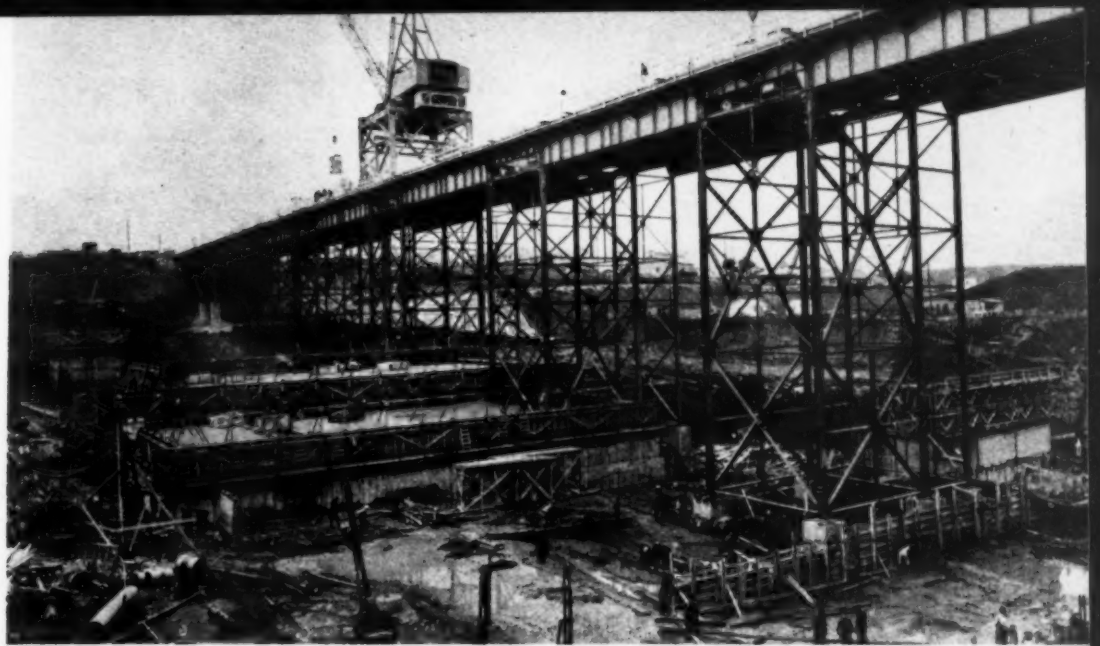


POINT OF CLOSURE (below) is nearly reached by cable-supported steel arch sections of Rainbow bridge, under construction across Niagara River at Niagara Falls, N. Y. New crossing between United States and Canada, costing \$3,760,000, is 1,450 ft. long, with 950-ft. steel arch, world's longest fixed-end arch. Steel erection is being done by Bethlehem Steel Co. Edward P. Lupler Engineering Corp., of Buffalo, N. Y., is supervising construction of bridge for Niagara Falls Bridge Commission; Waddell & Hardesty, of New York, designed structure.





NEW PUBLISHER OF "CONSTRUCTION METHODS" and of its associate publication "Engineering News-Record" is JOHN ABBINK, director of McGraw-Hill Publishing Co. and president of one of its subsidiaries, Business Publishers International Corp., serving Central and South American readers with engineering and automotive publications printed in Spanish. After



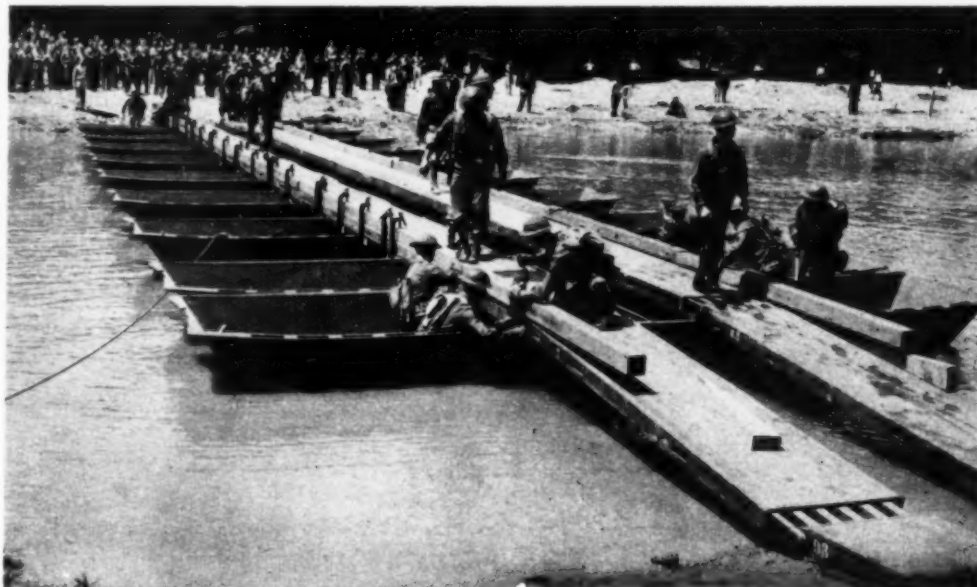
CHEROKEE DAM. Tennessee Valley Authority project on Holston River 26 mi. northeast of Knoxville, grows apace as concrete for main body of masonry structure, 1,277 ft. long (including 412-ft. spillway) and 175 ft. high, is lowered to place from tall steel trestle by gantry-mounted revolving cranes. Masonry section of dam will be flanked on each side by rock fill embankments, making total length of dam 6,750 ft.

service with International General Electric Co., Mr. Abbink joined McGraw-Hill organization in 1921. He is an authority on export matters and represented United States as delegate to Pan-American Highway Congress at Santiago, Chile, in 1939. Mr. Abbink assumed his new publishing responsibilities May 5.



CONSTRUCTION BY CONTRACT. after competitive bidding, as contrasted with boondoggling methods, is emphasized by these 3x5-ft. sheet metal signs which members of Associated General Contractors of America are erecting on their projects to inform public that work is being done "cheapest, quickest and best way."

FROM TALL CONSTRUCTION TRESTLE (below) across San Joaquin River huge hammerhead cranes and revolving cranes fed by five single-car trains lower concrete in buckets to blocks forming body of 300-ft. high Friant dam, U. S. Bureau of Reclamation project in California being built by Griffith Co.-Bent Co.



MILITARY ENGINEERING DEMONSTRATION is staged at Fort Belvoir, Va., when members of Company E, Fifth Engineers (combat) construct pontoon bridge.

Wide World Photo





ARMY AND NAVY RUSH *Southeastern Defenses*

By VINCENT B. SMITH
Associate Editor
Construction Methods



WEST PALM BEACH ARMY AIR BASE to accommodate 2,200 Air Corps troops is constructed under supervision of P. C. LISSENDEN (left), general superintendent for Watt & Sinclair of Florida, Inc., and Cleary Bros. Construction Co., fixed-fee contractors, and of Capt. C. A. ADDINGTON, Corps of Engineers, U. S. Army, resident engineer.

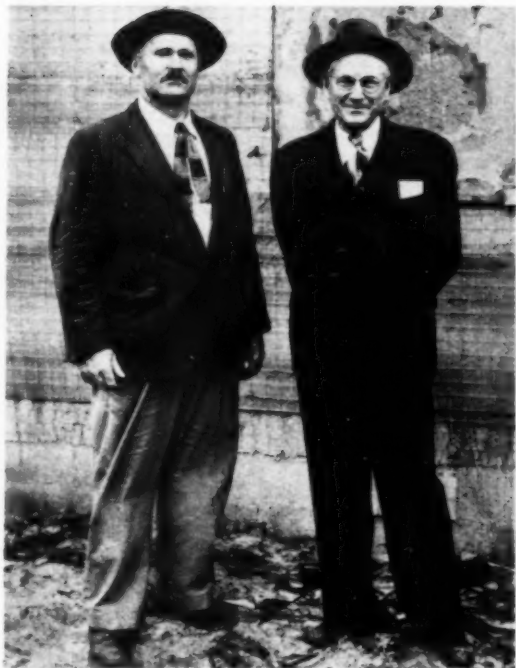
FROM KEY WEST TO THE CAROLINAS and from Tampa westward along the Gulf Coast, the Army and Navy have rushed completion of southeastern defenses in a frost-free winter climate unhampered by the snows and freezing weather which sometimes impede projects in northern latitudes. Evidence of activity and progress up to March in the southeastern area is offered by accompanying photographs, which show work actively under construction without special reference to primary projects already completed and commissioned. Projects illustrated represent much less than 50 per cent of the total defense construction in the four states of Florida, Georgia, South Carolina and Alabama; complete coverage of all projects would require more space than these pages can provide. Southeastern defenses already are prepared to take on the job of stopping any attack upon the continental United States from that quarter, now being further fortified by a chain of island bases at present under construction many miles off shore.

Federal funds to the extent of some two hundred million dollars have financed operations of the government's two service branches in the four southeastern states; contractors,

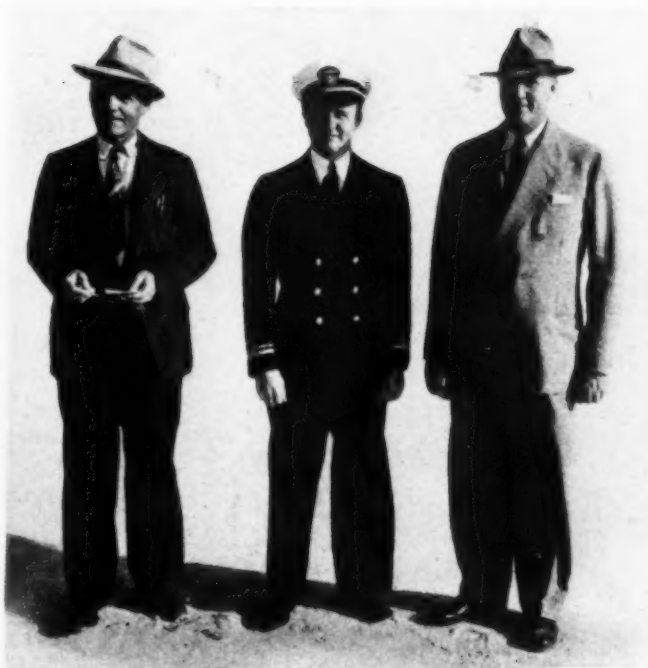


JACKSONVILLE NAVAL AIR STATION (to which Navy Department has allotted \$33,000,000 up to present for construction of facilities under supervision of Civil Engineer Corps officers representing Bureau of Yards and Docks) involves about \$16,000,000 worth of fixed-fee work designed by Robert & Co., Atlanta, engineer-architects, and constructed by contractor combination comprising Duval Engineering & Contracting Co., Jacksonville, The George D. Auchter Co., Jacksonville, and Batson Cook Co., West Point, Ga. Men in charge are: (Left to right) ALEXANDER BREST, Duval Engineering

& Contracting Co., member of fixed-fee contractors' operating committee; Lieut. C. B. McFARLAND (CEC) U.S.N.R., resident officer in charge of contracts; JOHN E. DAVIS, Batson Cook Co., member of operating committee; Lt. Comdr. ROBERT H. MEADE (CEC) U.S.N., officer in charge of construction; GEORGE H. HODGES, Duval Engineering & Contracting Co.; GEORGE D. AUCHTER, The George D. Auchter Co., member of operating committee; and A. J. COOPER, Robert & Co., engineers.



FAST HOUSING JOB for married personnel at Jacksonville Naval Air Station is completed under direction of **GEORGE WORT** (left), superintendent, and **C. E. HILLYER**, of Hillyer & Lovan, fixed-fee contractors, Jacksonville.

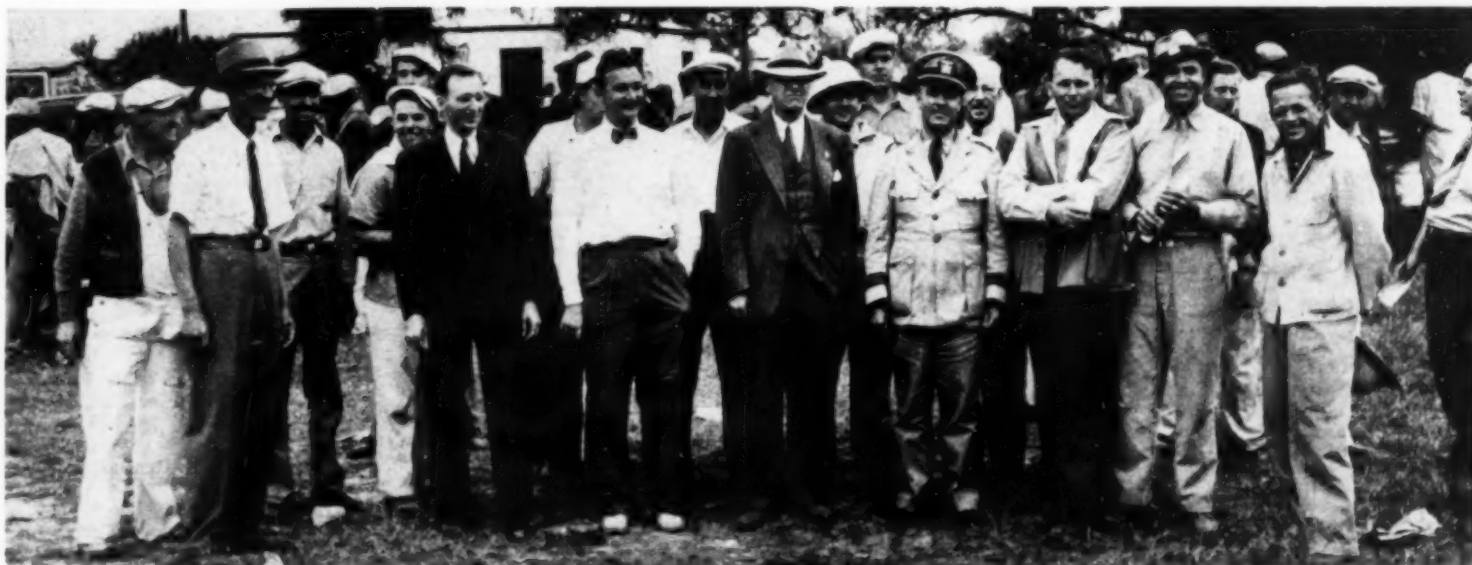


CONSTRUCTION OF MARINE IMPROVEMENT at Key West, Fla., Naval Station proceeds under watchful eyes of: (right to left) **R. E. COLVIN**, project manager, The W. P. Thurston Co., fixed-fee contractor, Richmond, Va.; **Lieut. H. F. WINN** (CEC) U.S.N.R., officer in charge in field; and **C. R. (Bill) GEORGE, Jr.**, superintendent.



DREDGING CONTRACT at Key West Naval Station by The **R. C. Huffman Construction Co.**, Buffalo, N. Y., brings together family team of **R. C. HUFFMAN, Sr.**, president (**above**), and **ROBERT C. HUFFMAN, Jr.**, vice-president and superintendent (**below**).

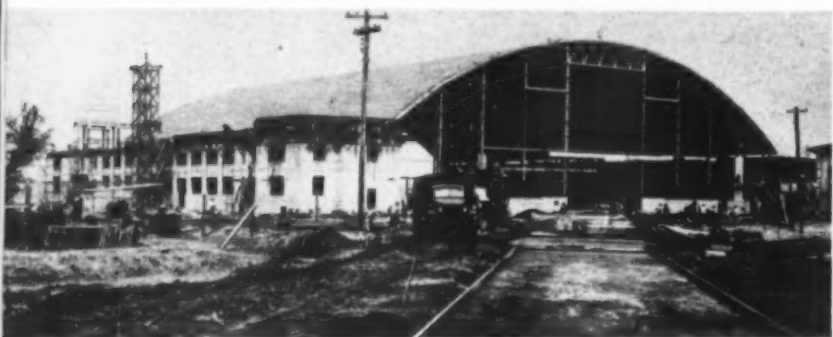
POPULAR MIAMI CUSTOM (right) calls for beer upon completion of last roof in housing job of The Mackle Co., erecting 200 single-family houses for married personnel of Opa Locka, Fla., Naval Air Station. These men are part of force which inclosed 200 concrete block houses in 46 working days after start of operations.



PARTICIPATING IN GENERAL JUBILATION at conclusion of major stage in high-speed housing schedule are several family members of The Mackle Co. standing in front line with **Lt. Comdr. E. W. C. Nice** (CEC) U.S.N.R., officer in charge of construction. (Left to right) **F. E. MACKLE, Jr.** (in white shirt and bow tie), **F. E. MACKLE, Sr.** (in hat), **Lt. Comdr. E. W. C. NICE**, and **ELLIOTT J. MACKLE**, project manager for The Mackle Co.



STRIPPED OVERBURDEN at MacDill Field, Tampa, is loaded by Bay City dragline into trucks for disposal.

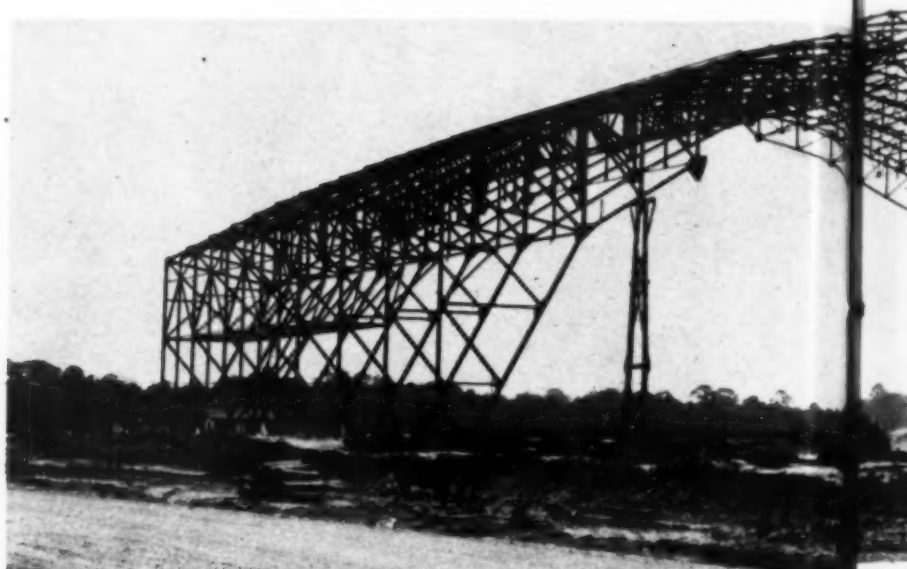
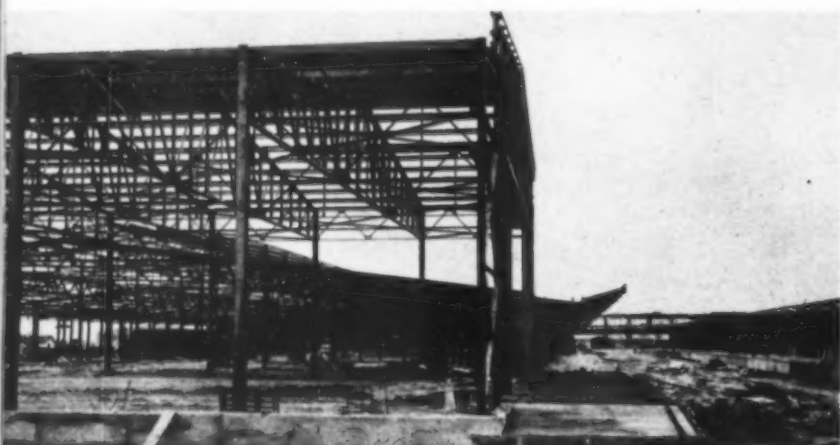


ARCH ROOF HANGAR of Army Southeast Air Base, MacDill Field, Tampa, Fla., has concrete outer walls of shops and offices built up with steel panel forms by Central Contracting Co., Atlanta, Ga., general lump-sum contractor for hangars. Concrete pavement for road in foreground is being placed by WPA with paving plant of Ebersbach Construction Co., Tampa, contractor for runways and aprons of MacDill Field.



TIED ARCH RIBS made up of 36-in. I-beams on 20-ft. centers, designed by Arch Roof Construction Co., support wood roof deck on purlins of base hangar erected by Central Contracting Co., Atlanta, Ga., at MacDill Field, Tampa, Fla.

DEPOT SUPPLY BUILDING (below) at Brookley Field, Army Southeast Air Depot, Mobile, Ala., involves two long wings of steel-frame mill-type structure with canopy roofs over loading platforms fronting on railroad track slot. Foster-Creighton Co., Nashville, Tenn., is contractor on lump-sum basis.



TIED THREE-HINGED ARCH TRUSSES for long-span hangar at Brookley Field, Army Southeast Air Depot, Mobile, Ala., are erected with long-boom crawler cranes, using timber bents to support haunch sections, by A. J. Rife Construction Co., Dallas, Tex.

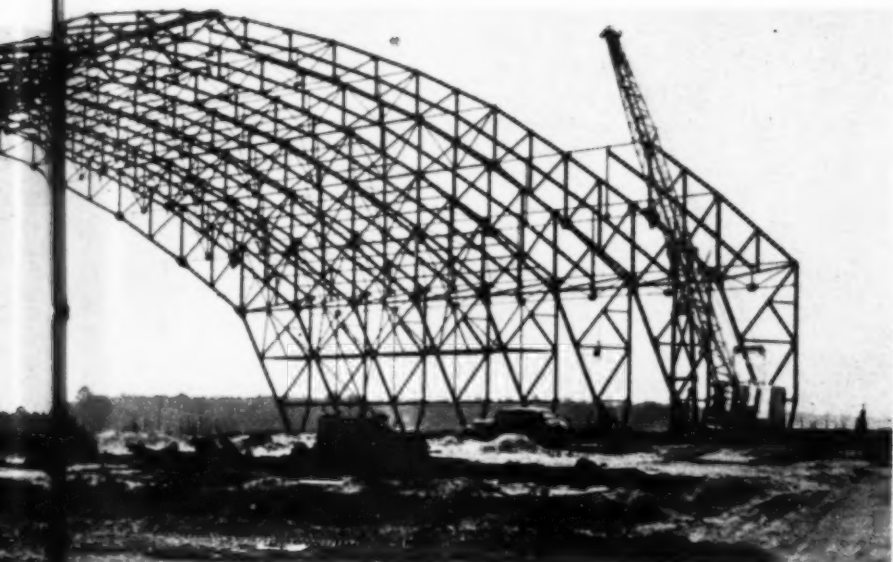
engineering personnel, equipment and materials have been drawn from the entire nation in the drive to complete the huge construction program on a fast schedule. Permanent bases placed under construction or completed ahead of the emergency defense program are being enlarged to accommodate increased armament and personnel. New bases have been permanently established at strategic points, equipped with temporary facilities, good for a life of 25 years, to house the expanded armed forces.

Primary defense of the long coast line and many offshore islands in this area rests with the air arms of the two service branches. For direct defense against attack from the sea, important air bases of both the Army and Navy, as well as strictly naval establishments of the latter branch, are located on or close to tidewater. These projects commonly encounter the following difficult conditions: low marsh land or sand soil, with ground elevations not much above high tide level; finished grade close to the groundwater table; low gradients



CUTTING TOUGH PALMETTO ROOTS in stripping cleared land for extension of MacDill Field, Army Southeast Air Base at Tampa, Fla., WPA forces utilize Hester disk plow equipped with 750-lb. rear wheel; unit is drawn by 70-hp. diesel tractor.

ARMY PROJECTS



DRAINAGE DITCH at Brookley Field, Mobile, Ala., is excavated by U. S. Engineer Department equipment, Lorain 1½-yd. dragline and ½-yd. shovel, loading into trucks:



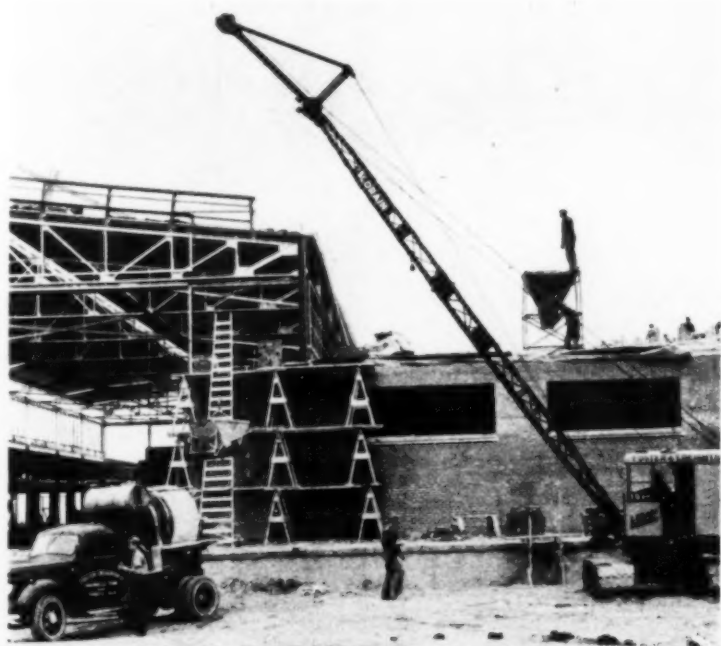
ELECTRIC WELDING OF JOINTS by U. S. Engineers saves time in constructing 8-in. steel gas main into Brookley Field, Army Southeast Air Depot, Mobile, Ala.



FOR SOIL-CEMENT CONSTRUCTION on runway at Tallahassee, Fla., Army Air Base, rotary tiller 8 ft. wide driven by power take-off from Caterpillar tractor pulverizes natural fill material loosened by cultivators, preparing soil for addition and mixing of portland cement. Ivy H. Smith and S. S. Jacobs Co., Jacksonville, Fla., contractors on cost-plus-fixed-fee work.



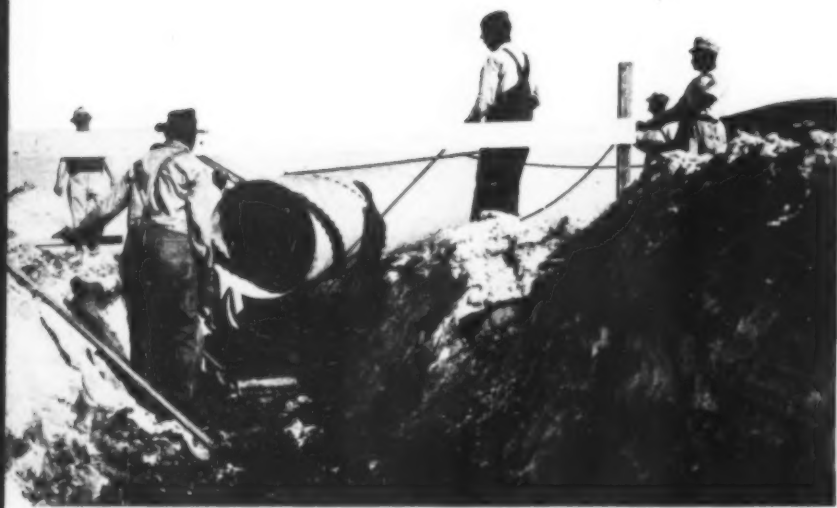
AIR CORPS CANTONMENT comprising 32 barracks and auxiliary buildings on hillside location above air field at Tallahassee, Fla. Army Air Base, is 90 per cent complete 4 months after start of first foundation by Ivy H. Smith and S. S. Jacobs Co., Jacksonville, Fla., on fixed-fee contract. Southern Engineering and Architectural Co., Jacksonville, are fixed-fee engineers.



TYPICAL CONCRETING PROCEDURE on most defense jobs in Southeast involves truck delivery of central-mixed concrete as here used by Foster-Creighton Co., Nashville, Tenn., on depot supply building at Brookley Field, Mobile, Ala. Lorain crane raises bucket to floor hopper.

ON EIGHTEENTH WORKING DAY (below) Goode Construction Co., fixed-fee contractor, Charlotte, N. C., incloses twentieth building in white troops' area of cantonment addition involving 50 buildings at Savannah, Ga., Army Air Base. Original directive at this base, calling for 190 buildings, was completed ready for occupancy three months after start of construction by same contractor.





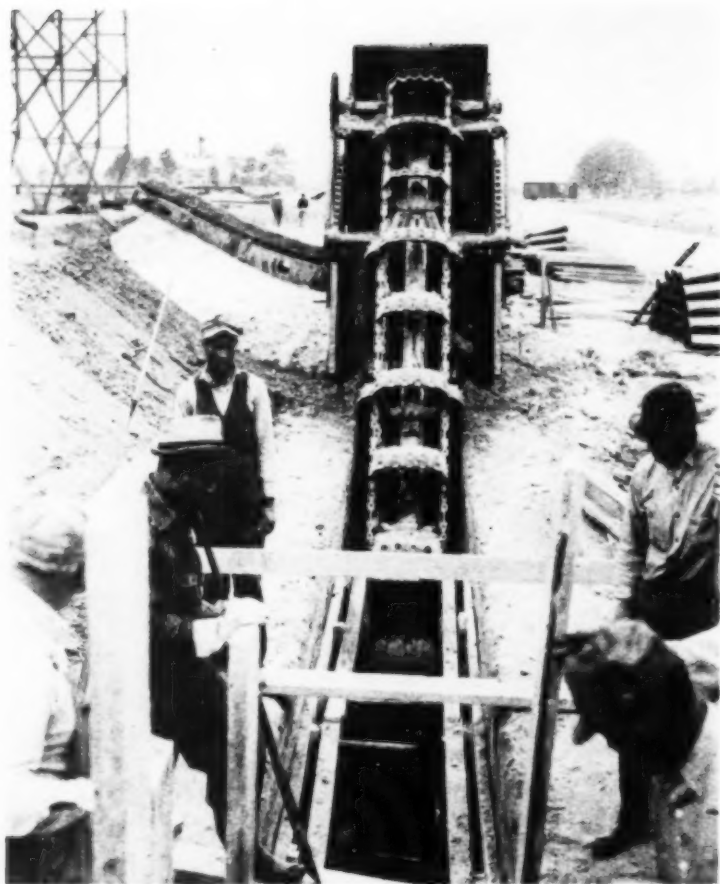
SALVAGED 36-IN. CULVERT PIPE from existing county airport (leased for 25 years by Army) is relaid in 520-ft. drainage line on 0.2 per cent grade for West Palm Beach, Fla., Air Base development by U. S. Engineers.



RAW SEWAGE at Savannah, Ga., Army Air Base passes through comminutor and is pre-chlorinated before entering two 8x34-ft. primary settling tanks equipped with sludge collecting apparatus, as first stage in activated sludge treatment plant, designed by Burge & Stevens, fixed-fee engineer-architects, Atlanta, and built by Goode Construction Co., fixed-fee contractor, Charlotte, N. C. Material then passes through aeration tank to secondary sedimentation tank. Effluent is post-chlorinated; sludge is digested in digester tank and dried in drying bed.



FOR PUMPING STATION CONSTRUCTION at West Palm Beach, Fla., Army Air Base, Watt & Sinclair of Florida, Inc., and Cleary Bros. Construction Co., Inc., contractors on fixed-fee job, employ three types of well points, all of which are effective in sand soil at this location. Total of about 60 points lowers groundwater 15 ft. at pumping station No. 1 in 13 days; 8-in. centrifugal pump is pulling about 50,000 gal. per hour from 6-in. header, considered low volume of pumpage for this part of Florida.



U. S. ENGINEER DITCHING MACHINE cuts trench braced by horizontal timbers and screw jacks for WPA force installing 8-in. vitrified clay pipe sanitary sewer at Brookley Field, Army Southeast Air Depot, Mobile, Ala.



LINED INSIDE AND OUT with 1/2-in. gypsum sheathing, warehouses of West Palm Beach, Fla., Army Air Base are doubly insulated. Exterior wall is covered with tough, crinkled building paper (to take care of expansion and contraction) and drop siding; interior, with t. & g. lumber. Other cantonment buildings have exterior sheathing, crinkled paper and siding only. Watt & Sinclair of Florida, Inc., Palm Beach, and Cleary Bros. Construction Co., Inc., West Palm Beach, are fixed-fee contractors; Solomon & Keis, Fort Lauderdale, Fla., and Troy, N. Y., are engineer consultants.



500,000 GAL. WATER TANK erected on pile foundations with overflow line about 140 ft. above ground, is filled by 12-in. delivery main from city system to MacDill Field, Tampa, Fla., one of rare bases where water is obtained from municipal supply.



CREOSOTED TIMBER PILES averaging 60 ft. long are driven into marsh mud and sand by A. J. Rife Construction Co., lump-sum contractor, Dallas, Tex., for hangar at Brookley Field, Army Air Corps Southeast Air Depot, Mobile, Ala.



DRIVEN 3,200 MI. TO JOB from factory in Portland, Ore., truck-mounted Mixermobile outfit equipped with Mercury V8 engine and 2-yd. mixing drum turns out concrete for A. J. Rife Construction Co. at Brookley Field, Army Southeast Air Depot, Mobile, Ala.

Southeastern Defenses ... **NAVY PROJECTS**

available for sewer lines and drains; and foundation conditions which frequently require piles and pre-drainage of deep excavations. Inland bases face similar problems in some places. All the projects without exception must procure or develop an assured water supply and provide for disposal of sewage.

Contractor Cooperation—Practically all contracts written since the advent of the emergency program are on a cost-plus-fixed-fee basis. As might be expected, unstinted cooperation by the engineer officers of the War and Navy Departments, by the engineer-architects and by the construction contractors mark the collaborative efforts of the owner and agents on projects covered by this type of agreement, creating a fine esprit de corps which is apparent to visitors. Less likely to be expected, and therefore more pleasantly surprising, is the equally fine spirit of cooperation which prevails on lump-sum jobs awarded on a competitive bid basis in advance of the emergency program. Lump-sum contractors are limited by their bid prices from employing overtime labor, unless provided under extra work orders, but the jobs are making rapid progress on a single-shift schedule.

Cost-plus-fixed-fee contracts are uni-

(Continued on page 50)



AIRFIELD RUNWAYS of Opa Locka Naval Air Station near Miami, Fla., have prime of rapid-curing asphalt cut-back on 6-in. base of coral lime rock compacted from 9-in. loose depth. At right, trucks and spreaders are distributing $\frac{1}{2}$ in. of pea lime rock over surface application of 0.4 gal. of hot semi-solid cut-back asphalt. Project started on July 15, and half of runways were put in service Dec. 1.

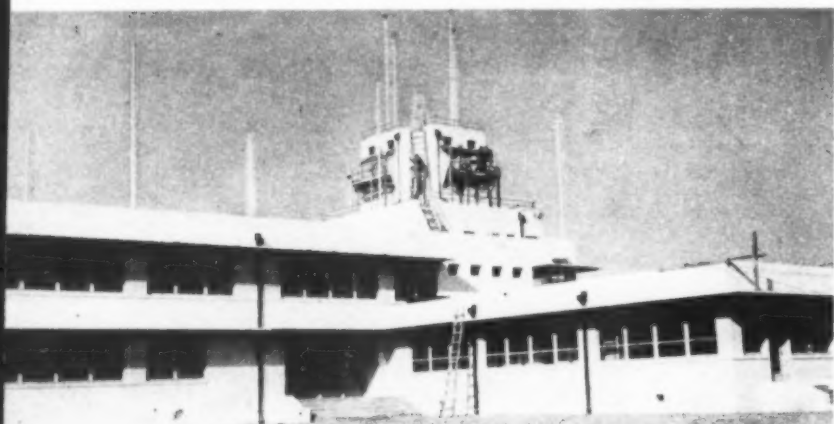


TYPICAL CONSTRUCTION of temporary wood frame buildings for Navy use is indicated by two-story administration unit and one-story structures of dispensary group erected as part of \$3,500,000 cost-plus-fixed-fee job by Fred Howland, Inc. & Jack Quinn, Inc., Miami, at Opa Locka Naval Air Station. Roll roofing for this class of construction consists of 90-lb. felt on 30-lb. underlayer; in this region of high winds, roll roofing probably will have to be replaced in 4 or 5 years.

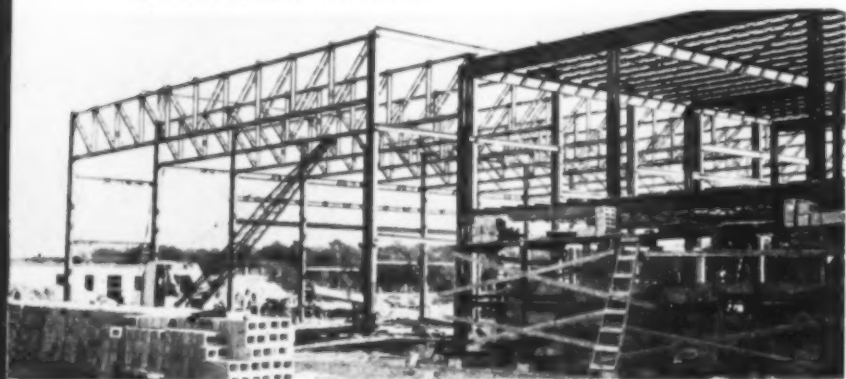
Southeastern Defenses...NAVY PROJECTS



PERMANENT ADMINISTRATION BUILDING at Jacksonville, Fla. Naval Air Station utilizes wood construction in modern design employing pleasing metal decorative features around main entrance. Erected by T. A. Loving & Co., Goldsboro, N. C., from plans by Robert & Co., Inc., Atlanta, Ga., building has concrete foundation walls and concrete pan floors.



ARCHITECTURAL CONCRETE lends itself to handsome design by Bureau of Yards and Docks for operation and control building erected by North-Eastern Construction Co., New York City, under lump-sum contract at Jacksonville Naval Air Station.

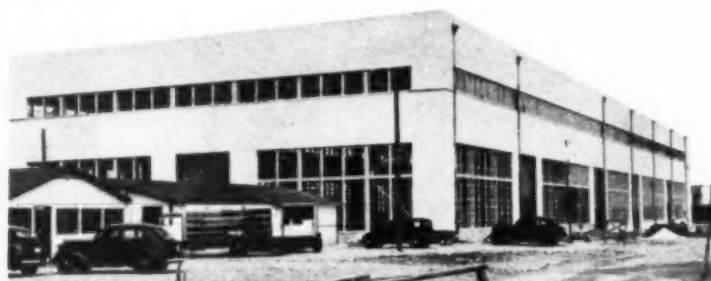


WELDED STEEL FRAMING for enlisted men's recreation building is erected at Jacksonville Naval Air Station by Aetna Steel Construction Co., Jacksonville, for fixed-fee contractors.

ASSEMBLY AND REPAIR SHOP (below) covering, with all its ramifications, total of 8 acres at Jacksonville Naval Air Station has large hangar space with 40-ft. clearance under trusses featuring heavy steel framing for 50-lb. wind load (150 m.p.h. velocity) applied in all permanent designs for this base. Facade employs concrete and glass blocks and large expanse of copper flashing over main door. Original building constructed by Doyle & Russell, Richmond, Va., under lump-sum contract is now being extended by fixed-fee contractors, Duval Engineering & Contracting Co., George D. Auchter Co. and Batson Cook Co.



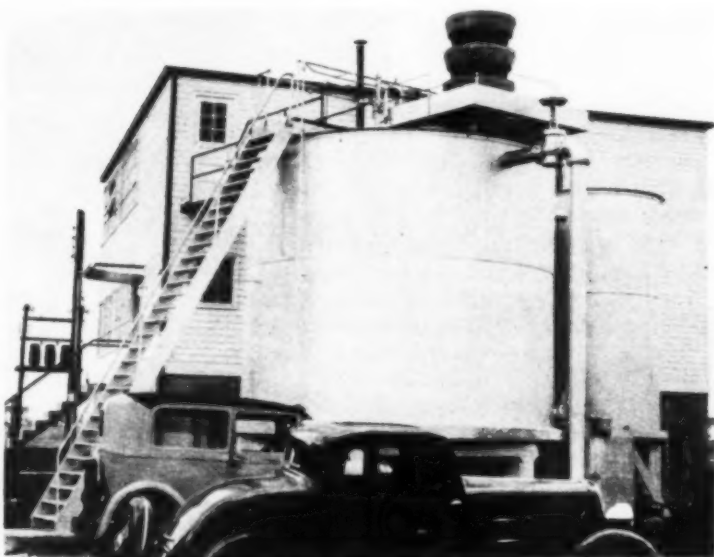
OLD FRIEND IN NEW SETTING. New York World's Fair bus, painted Navy gray, drives down surface-treated lime rock road at Jacksonville Naval Air Station in direction of reinforced-concrete general storehouse, erected on lump-sum basis by Hillyer & Lovan, Jacksonville, and now being extended as part of fixed-fee work by later contractors. In common with other heavy structures in air station's industrial area, partially formed by dredging swamp muck to 45-ft. depth and replacing with 55-lb. hydraulic sand fill, general storehouse rests on untreated timber piles cut off below ground-water table.



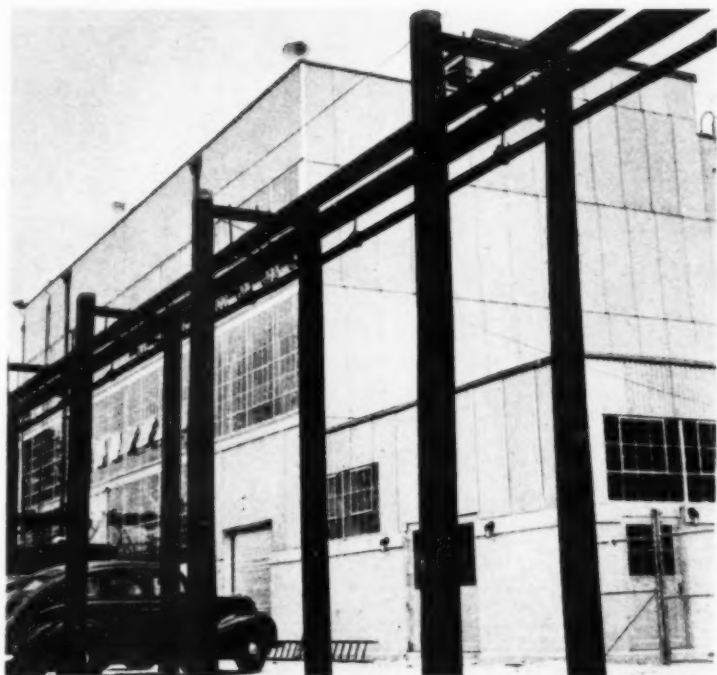
AIRCRAFT STOREHOUSE constructed at Jacksonville by Hillyer & Lovan under lump-sum contract has heavy steel frame to provide for overhead bridge crane operation covering unobstructed length and breadth of building, which is served by large sliding doors at far end, as well as by vertical roll-up doors which are visible. Pilasters and spandrels are concrete block masonry, with stucco exterior.



PERMANENT BARRACKS of architectural reinforced concrete designed by Albert Kahn, Detroit, and erected at Jacksonville Naval Air Station by Artley Co., lump-sum contractor, Savannah, Ga., comprise eight duplicate units connected by weathertight corridor leading to mess hall of similar concrete construction.



WATER SOFTENING PLANT for treatment of well water drawn from lime rock substrata at Opa Locka, Fla., Naval Air Station, includes tank for softening by use of lime and alum, smaller tank at right for carbonizing water by bubbling carbon dioxide gas through it, and aerator at top.

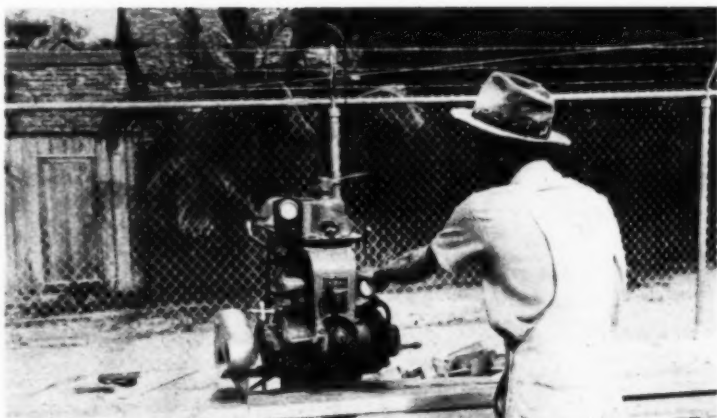


POWER HOUSE NO. 2 for expanded naval air station at Jacksonville, Fla. is added by fixed-fee contractors under emergency program. Steel-frame building containing three boilers with individual capacity of 45,000 lb. of steam per hour has walls inclosed with asbestos-cement siding. Elevated steam lines supported by pole bents effect considerable economy over underground construction.



WATERPROOFED GUNITE EXTERIOR COAT applied on wire mesh over dampproofed fiber board sheathing attached to prefabricated Stran-Steel framing marks 100 two-family units speedily erected by Hillyer & Loran at Jacksonville Naval Air Station. After completing concrete pan floors on bar joists, contractor erected frames for 72 houses in six days. Interior walls are covered with hard fiber board cut to full room size. Construction cost of completely equipped houses, with no land cost or outside utilities included, is about \$2,600 per dwelling unit.

Southeastern Defenses . . . **SMALL TOOLS ON ARMY PROJECTS**



PRECUTTING LUMBER for sound school being erected by The W. P. Thurston Co., Richmond, Va., as part of fixed-fee contract at Key West, Fla., Naval Station, carpenter operates Walker-Turner radial saw equipped with 12-in. blade.

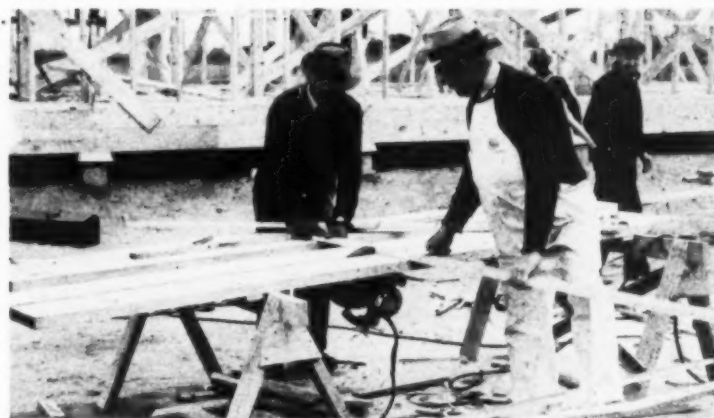
Low Cost Housing for Navy Married Personnel



SIX-FAMILY WOOD-FRAME HOUSES to provide dwelling facilities for 200 married men at Charleston, S. C., Navy Yard are erected (on land purchased outside reservation) by Southeastern Construction Co., Charlotte, N. C., fixed-fee contractor, with enough left over out of \$590,800 appropriation, including land cost, to permit addition of one or two more six-family units. Houses have dampproofed insulating fiber board sheathing, asbestos-cement siding and roof shingles, hard fiber wallboard for interior walls and softer fiber board for ceilings. Contract was signed Oct. 25, and 48 families moved in for first occupancy on Feb. 1.



BUILT AND COMPLETELY EQUIPPED at cost of less than \$2,400 each, 200 single-family four-room houses of concrete block and exterior stucco construction, with cement tile roofs, are erected and roofed in 46 working days by The Mackle Co., Miami, Fla., for the Opa Locka Naval Air Station. Standard plan by Lt. Comdr. E. W. C. Nice, Officer in Charge, achieves exceptional quality and low cost in houses adapted to six exterior variations.



TILTED TO MAKE BEVEL CUTS in barracks bridging, Porter-Cable Speedomatic electric saw is temporarily installed under improvised table to speed carpenter work for Goode Construction Co., Charlotte, N. C., fixed-fee contractor on Savannah, Ga., Army Air Base.



FLANGE-BEVELING KNIVES on Johns-Manville tool trim Transite conduit flanges for sleeve couplings at angle bends in underground electrical conduit lines installed under direction of U. S. Engineers by WPA at Brookley Field, Army Southeast Air Base, Mobile, Ala.



DIGGING HOLES for installation of screw anchors (transmission line type) to tie down airplanes on soil-cement parking apron of Tallahassee, Fla., Army Air Base, Ivy H. Smith & S. S. Jacobs Co., fixed-fee contractors, Jacksonville, use Standard augers equipped with manually controlled bucket leaves for bringing up and discharging earth.



TWO MEN on heavy-duty portable electric drill quickly cut bolt hole in diagonal of timber truss on one-story cantonment building of West Palm Beach, Fla., Army Air Base, built under fixed-fee contract by Watt & Sinclair of Florida, Inc., Palm Beach, and Cleary Bros. Construction Co., West Palm Beach.

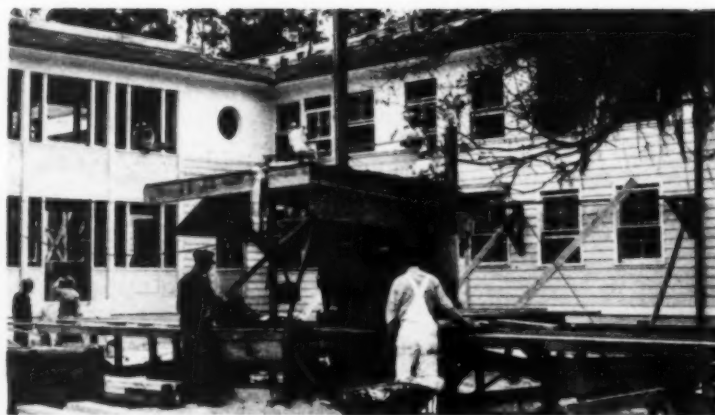
versally recognized as admirable instruments by all participants involved in emergency construction of defense projects. On a strictly business basis, apart from patriotic motives and the assurance of useful work with protection against loss under emergency conditions, a number of contractors look upon fixed-fee construction as a not particularly attractive form of venture. In the present circumstances, when high-speed construction is essential to national defense, these constructors regard the cost-plus-fixed-fee contract as the best instrument ever devised, affording equal protection to the government, to the engineer-architect and to the construction contractor.

Job Organization — Under an officer in charge for the Army or Navy, projects in general are organized in separate divisions for the engineer-architects and for the construction contractor. A project manager or similar representative (sometimes a board of direction or a general superintendent), ordinarily has complete charge of construction activities as the representative of the contracting firm, with full authority

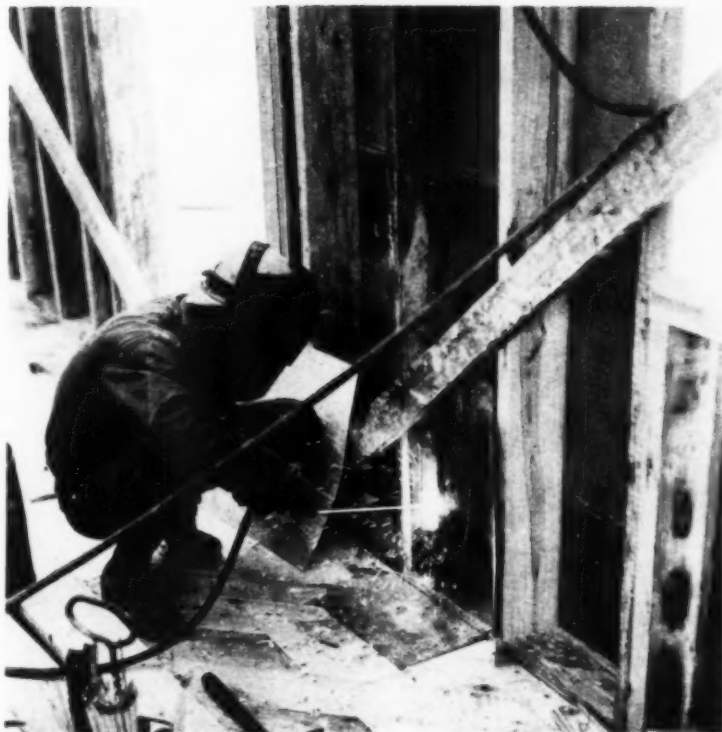
Southeastern Defenses . . . **SMALL TOOLS ON NAVY PROJECTS**



PIPE TAPPING MACHINE makes service connection to Transite asbestos-cement water main at West Palm Beach, Fla., Army Air Base on fixed-fee contract of Watt & Sinclair of Florida, Inc., and Cleary Bros. Construction Co., Mueller device, capable of tapping Transite and metal mains either empty or under pressure, operates through bronze corporation cock and bushed opening in galvanized saddle to complete this connection in 15-min. total working time.



FOR BACHELOR OFFICERS' QUARTERS, permanent building at Jacksonville, Fla., Naval Air Station, T. A. Loving & Co., contractor, Goldsboro, N. C., precuts lumber with DeWalt variable-adjustment woodworking saw.



HURRICANE RODS tying roof plates to foundations are welded (with Lincoln electrodes and generator) to anchor stubs projecting upward through sills from foundation walls in building for sound school erected by The W. P. Thurston Co., Richmond, Va., at Key West Naval Station.



TO BEND PIPE in bachelor officers' quarters on contract of T. A. Loving & Co., Goldsboro, N. C., at Jacksonville Naval Air Station, plumber uses Greenlee hydraulic pipe bender capable of taking sizes from 1 1/4 to 2 1/2 in.

to make decisions on all matters pertaining to the job. Jobs of larger size are departmentalized under the project manager, with a superintendent in charge of each section.

Paving — Airfield runways represent the largest paved areas involved in the contracts. Accompanying photographs show two types of runway pavement, soil-cement and bituminous surface treatment on limestone base. For large, central fields, where air traffic is concentrated and heavy, reinforced-concrete runways are extensively used. Warming-up aprons, where oil drippings are an important factor, are likewise usually of reinforced-concrete construction. Some fields possessing the proper soil characteristics have utilized mixed-in-place sand asphalt pavement for runways. Soil characteristics are determining factors in the choice of soil-cement construction, which the U. S. Engineers are applying on army air corps projects in the Southeast where conditions are favorable.

Drainage—Porous sandy soil in the coastal region is cap-

able of taking care of surface drainage except for the runoff from large expanses of paved runways. The runways ordinarily are flanked by broad, surface-treated shoulders which greatly increase the impervious width. Surface runoff from these areas is provided for in a number of ways, ranging from simple to elaborate: (1) shallow, open ditches leading away to main drainage ditches, (2) edge drains of open joint

(Continued on page 103)

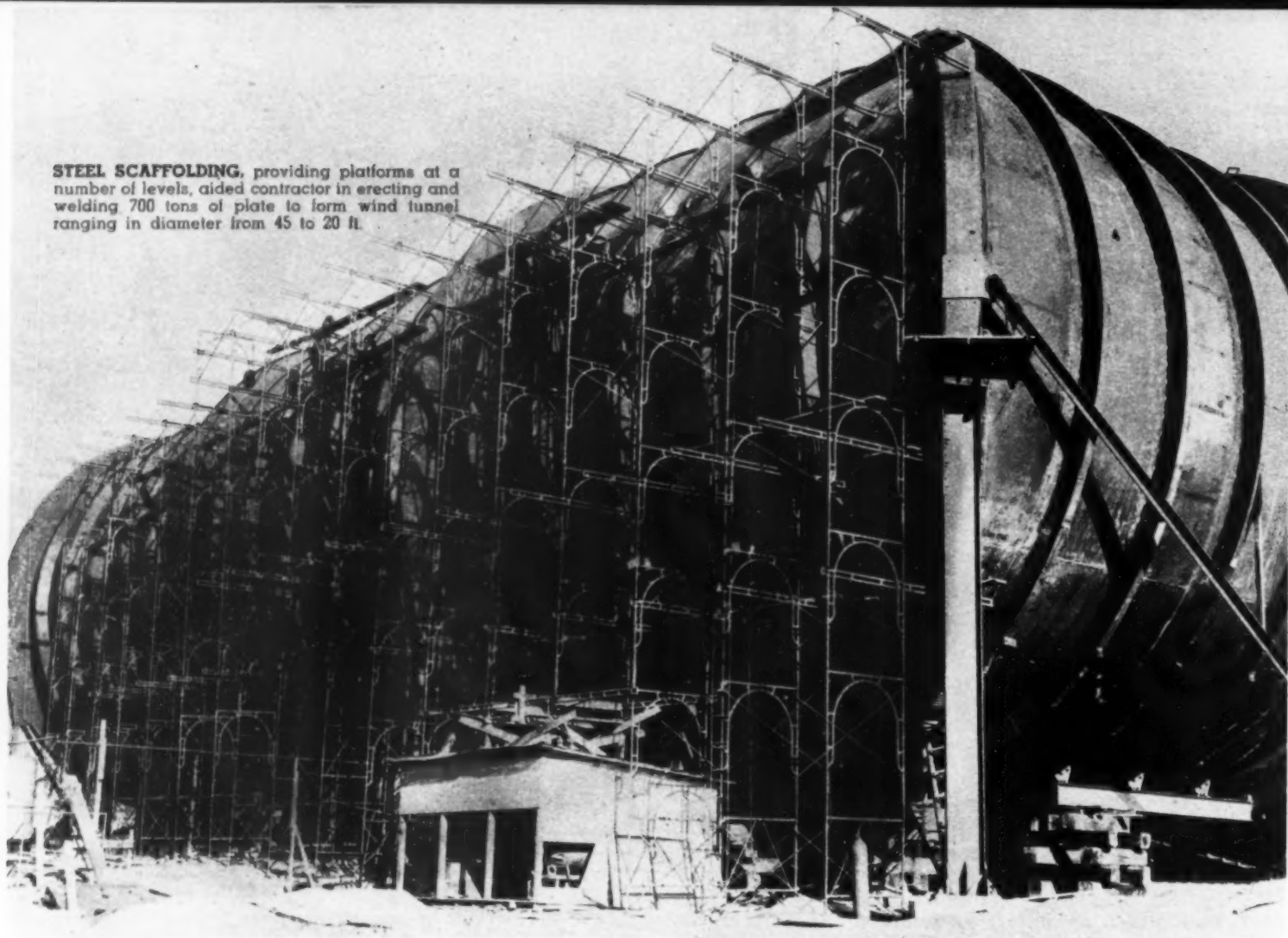


TRIMMING WOOD ROOF SHEATHING to scribed line on building for sound school at Key West Naval Station, carpenters of The W. P. Thurston Co., fixed-fee contractor, Richmond, Va., employ portable electric saw.



ELECTRICIAN drills conduit holes with extensible chain-operated Greenlee joist borer in sound school wood-frame building on fixed-fee contract of The W. P. Thurston Co., Richmond, Va., at Key West, Fla., Naval Station.

STEEL SCAFFOLDING, providing platforms at a number of levels, aided contractor in erecting and welding 700 tons of plate to form wind tunnel ranging in diameter from 45 to 20 ft.

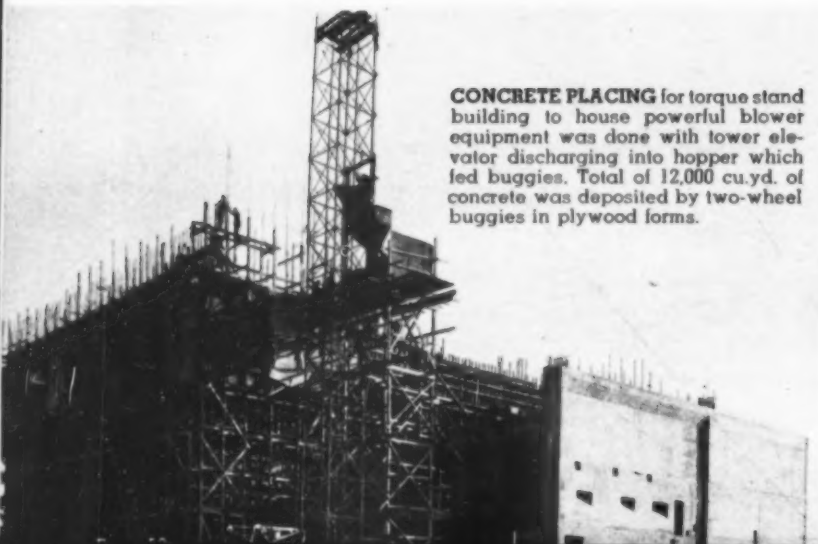


Photos, U. S. Army Air Corps.

ERECTION OF STEEL PLATE for 45-ft.-diameter wind tunnel at Wright Field is handled by long-boom crane.



CONCRETE PLACING for torque stand building to house powerful blower equipment was done with tower elevator discharging into hopper which fed buggies. Total of 12,000 cu.yd. of concrete was deposited by two-wheel buggies in plywood forms.



Big Steel Wind Tunnel

BUILT TO TEST AIRCRAFT MODELS

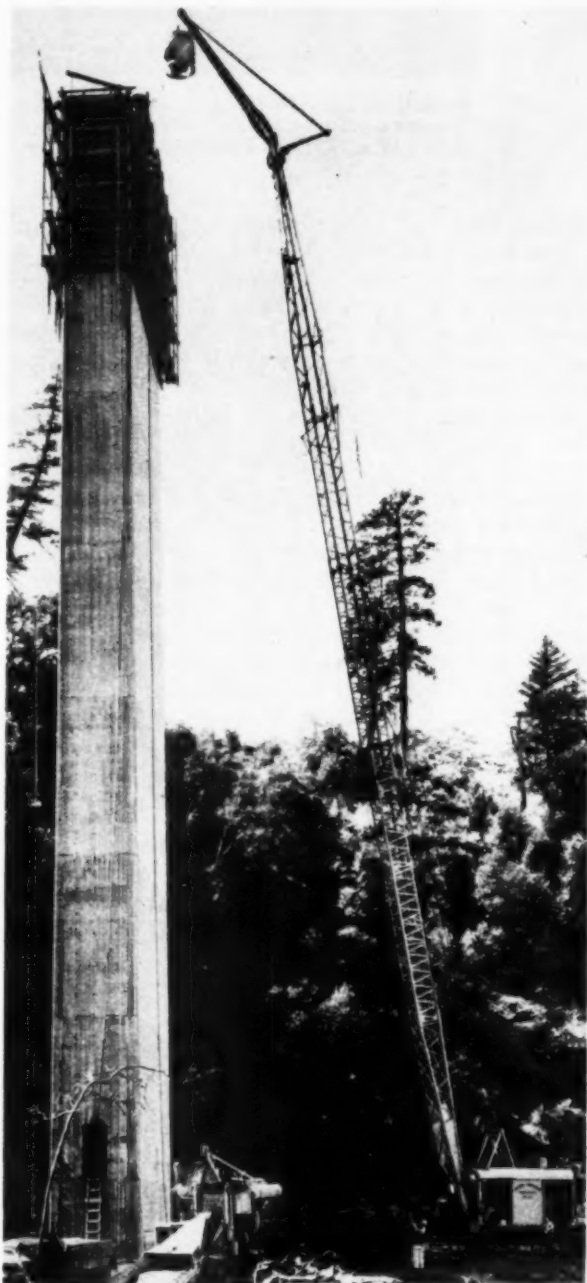
FOR TESTING AIRCRAFT MODELS of 15-ft. wing spread a huge wind tunnel and torque stand building have been built for the U. S. Army Air Corps at Wright Field, Dayton, Ohio. The circular tunnel, ranging in diameter from a maximum of 45 ft. to a minimum of 20 ft. at the testing section, forms a closed circuit 616 ft. long, involving the erection of 700 tons of sheet and structural steel. With this equipment actual flying conditions at speeds of 400 m.p.h. can be simulated.

Structural steel for the wind tunnel, consisting of welded plates, was erected by the R. C. Mahon Co., of Detroit, Mich., under a subcontract with the National Concrete Fireproofing Co., of Cleveland, Ohio, which held the \$700,000 general contract, including a reinforced concrete test chamber 58 ft. high, across the line of the tunnel, in which the model planes will be tested.

All power equipment is housed in a separate torque stand building of reinforced concrete design 80 ft. high, built under a \$400,000 contract by the Simpson Construction Co., of Chicago. For this structure concrete was raised by a vertical tower elevator and delivered from a hopper by buggies into plywood forms, as illustrated.

JOB

oddities



A GIRAFFE AMONG CRANES is this Lima machine with 140-ft. boom and 20-ft. jib, used by United Concrete Pipe Co., of Los Angeles to deliver concrete in 1-yd. bucket to tall bridge pier near Redding, Calif., being built to support bridge for relocating Southern Pacific R. R. around site of Shasta reservoir. Concrete and bucket weigh 5,000 lb. Crane also handles placing of forms for tall tower.

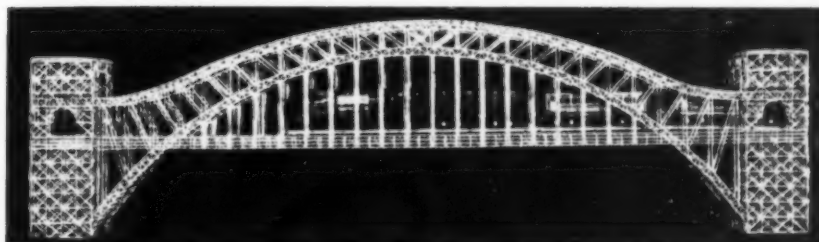
PAINTED IN 3 MINUTES, 18 SECONDS. (Right) New record was established in Kansas City, Mo., when 114 painters applied 80 gal. of paint to 8,000 sq. ft. of 10-room house in Kansas City, Mo.

Acme Photo



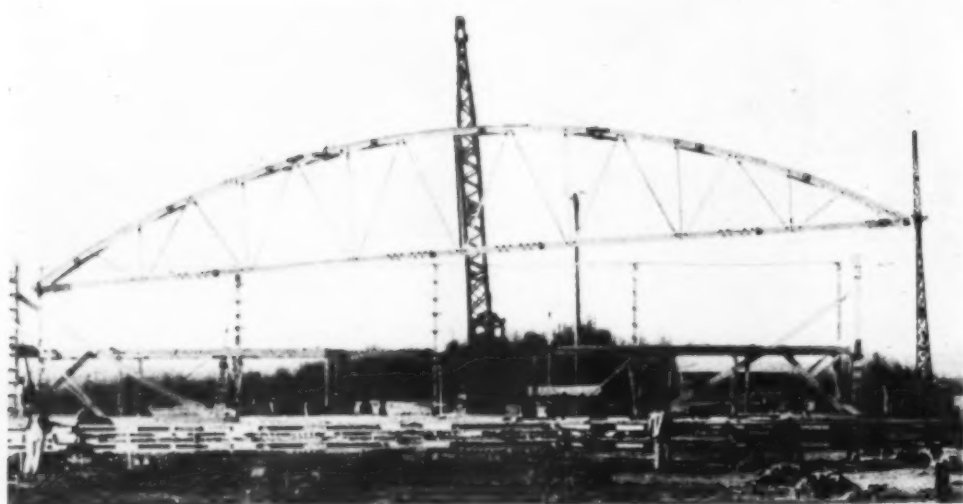
HUGE CANVAS TENT is hung in canyon over site of Mud Mountain Dam to protect from rain and snow during construction of earth and rock fill being placed by Guy F. Atkinson Co., of San Francisco, which holds contract for 425-ft.-high structure on White River near Enumclaw, Wash. Purpose of covering, which is 280 ft. long and 196 ft. in maximum width, is to control moisture content of earthfill core, in accordance with specifications of U. S. Engineer Department.

Photo R. C. Barrett

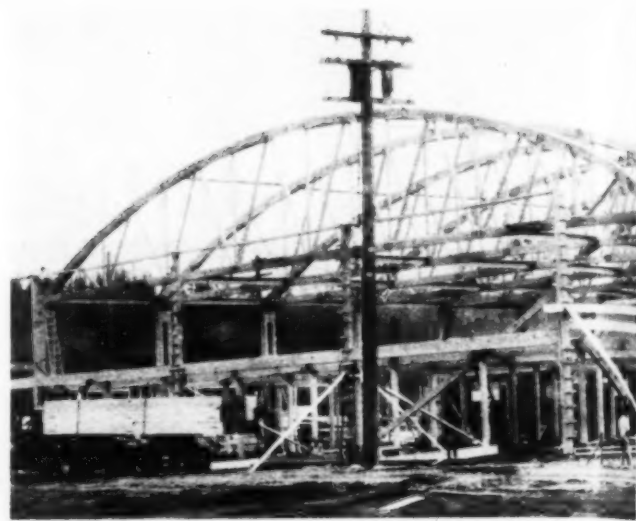


BUILT OF 31,000 TOOTHPICKS, this arch bridge with span of 44 in., required about month's time on part of Dr. and Mrs. M. Russell Stein, who have organized National Pick Builders Club, Inc., in interests of those who practice model building of structures as hobby.





MARCH 13, 3:30 P.M.—First of twelve 130-ft. span Teco-connected roof trusses is fabricated and erected by Timber Structures, Inc. for mold loft of Oregon Shipbuilding Corp., at Portland, Ore.



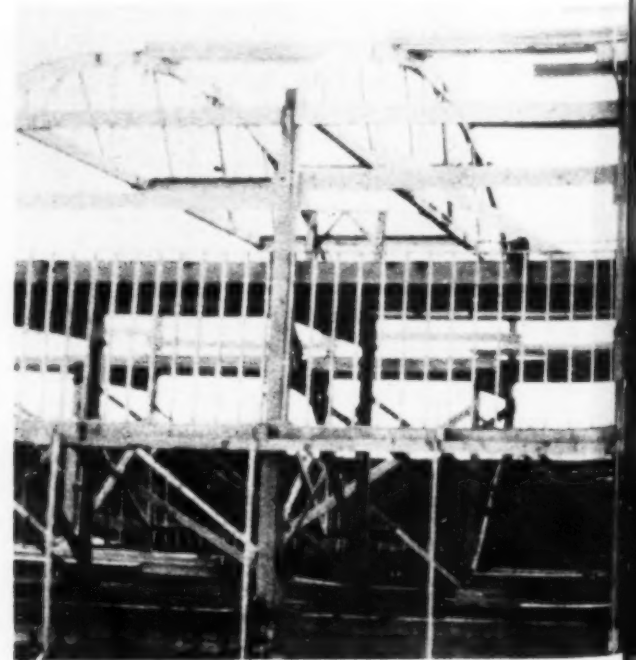
MARCH 17, 4:30 P.M.—Last of twelve 130-ft. span bowstring roof trusses for mold loft of Oregon Shipbuilding Corp., at Portland, is in place. Erec-

Prefabricated Lumber

SPEEDS SHIPYARD BUILDING

A TWO-OCEAN NAVY and a "bridge of ships to Britain" now has the country's long dormant shipyards pushed to their limits. Dismantled and abandoned, in many cases, after the last war, these yards suddenly found themselves loaded with rush orders. In a number of instances prefabricated lumber construction made it possible for them to get into production according to schedule.

From a ship-builder's standpoint some timber construction work for the California Shipbuilding Co. at Los Angeles, was in the nature of an experiment. It did not remain in the experimental stage for long. When the shipyard industry saw fourteen huge timber trusses necessary to roof a building of approximately 350x120 ft., hoisted into place in 5½ hr. ready for the roofers and siding men to go to work, it began taking a second look at the low-cost "hurry up" opportunities made possible by the recent great expansion in facilities for prefabricating heavy lumber units for industrial buildings. This record was established in the erection of a mold loft building on the west basin of Los Angeles harbor. Summerbell Roof Structures, of Los Angeles, started their part of the job on Feb. 17 and completed it Feb. 28, with a normal working crew, only one shift and no overtime.



MOLD LOFT (above and right) for Willamette Iron & Steel Corp., Portland, Ore., required 21 Teco-connected timber trusses of 80-ft. span, spaced on 20-ft. centers. All trusses were delivered complete in 6 days after receipt of order by Timber Structures, Inc.

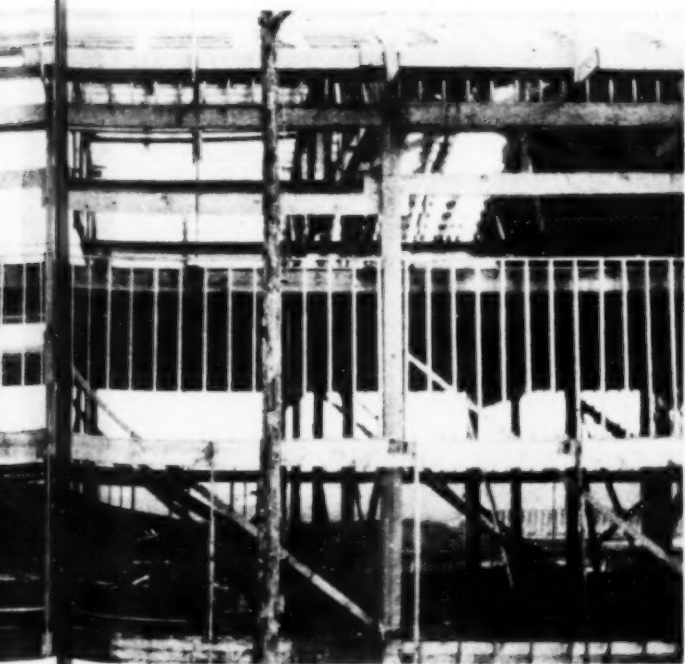


tion of entire frame for this structure, including roof trusses fabricated with aid of timber connectors, required only four 8-hr. shifts.

Today with the fast cooperation of prefabricated lumber construction, shipyards and drydocks, dotted along the coast from Baltimore on the Atlantic to Seattle and Portland in the Pacific Northwest, are laying keels and launching vessels of every size and description. In a number of cases ships have been able to slide down the ways ahead of schedule. Both naval and merchant marine construction is going forward in most of these yards. In addition to present construction, some of the yards are now in a position to add between 50 and 60 new ways to take care of additional allocations for merchant ships recently made by the President. In most cases the yards' administrative, designing and fabricating facilities are already adequate to keep the proposed new ways humming.

An indication of how shipyards, aided

(Continued on page 106)



NAVY BUILDS



Temporary Hospital Barracks

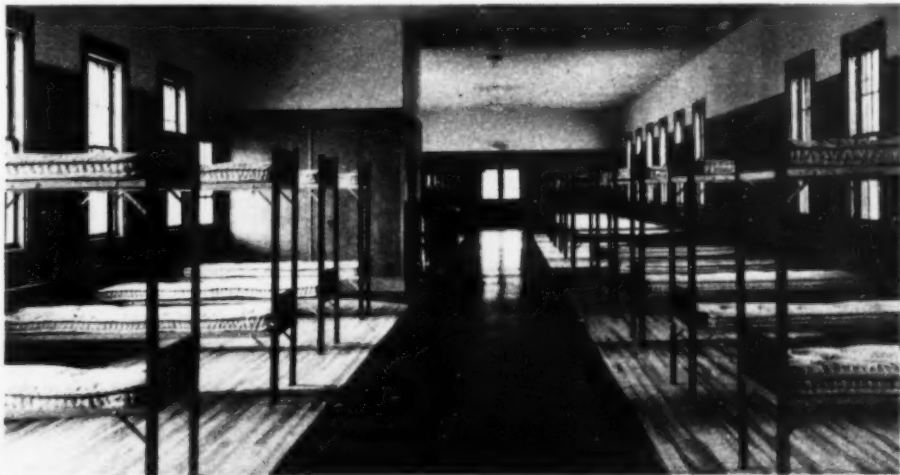
GOOD FOR AN ESTIMATED USEFUL LIFE of 25 years, if required, four temporary H-type one-story wood-frame barracks erected by E. E. Weddle, contractor, Norfolk, Va., for the Corps men (pharmacists) school at the Norfolk Naval Hospital, Portsmouth, Va., have durable, pleasing surface finishes both inside and out. Resting on concrete foundation walls and columns, the timber frame is inclosed with walls and roof consisting of Johns-Manville asbestos-cement shingles over building paper or roofing felt on wood sheathing, the sheathing being placed diagonally in the walls. Interior walls are surfaced with a natural plywood wainscoat which is

given two coats of Rez, a soy bean varnish, and one coat of wax.

Painted ceilings and walls above the wainscoat are U.S. gypsum wallboard designed with slightly recessed shoulders which meet at the butt joints; the joints are sealed flush by perforated adhesive tape applied in the recess. Finished floor of rift edge grain pine receives two coats of soy bean product and one coat of wax. The four H-type buildings were erected at the U. S. Naval Hospital under cost-plus-fixed-fee contract with the Bureau of Yards and Docks under supervision of Commander A. K. Fogg (CEC) U.S.N., public works officer, Norfolk Navy Yard, Portsmouth, Va.



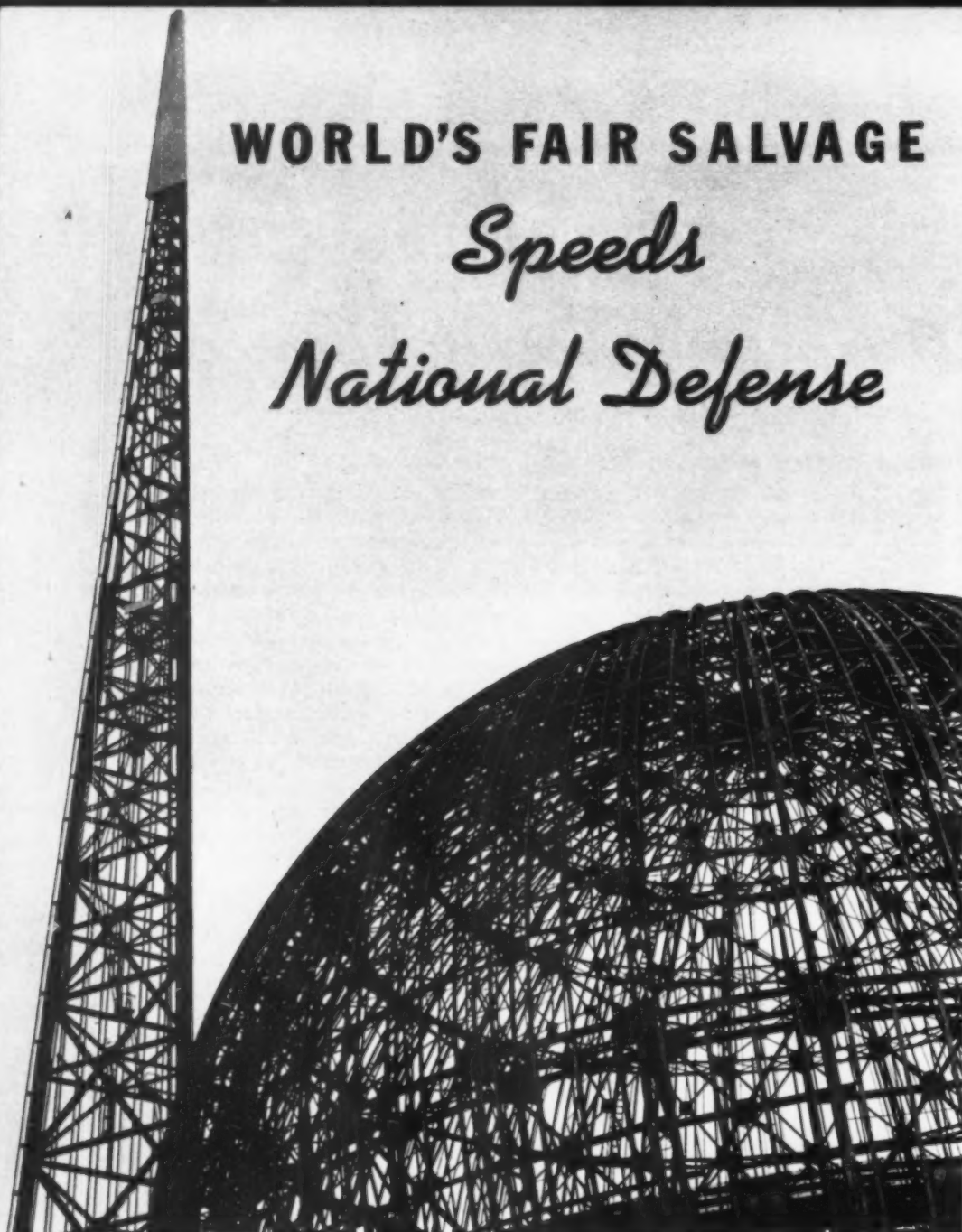
DIAGONAL WOOD SHEATHING, building paper and asbestos-cement shingles inclose walls of temporary barracks for Corps men at Naval Hospital. On roof, asbestos-cement shingles are laid over roofing felt on wood sheathing.



PLYWOOD WAINSCOT, with gypsum wallboard walls and ceiling above, is used in interior of barracks. Linoleum aisles and rift edge-grain pine are laid flush in finished floor. Both plywood wainscoat and pine flooring are treated with two coats of soy bean varnish and one coat of wax.

WORLD'S FAIR SALVAGE

Speeds National Defense

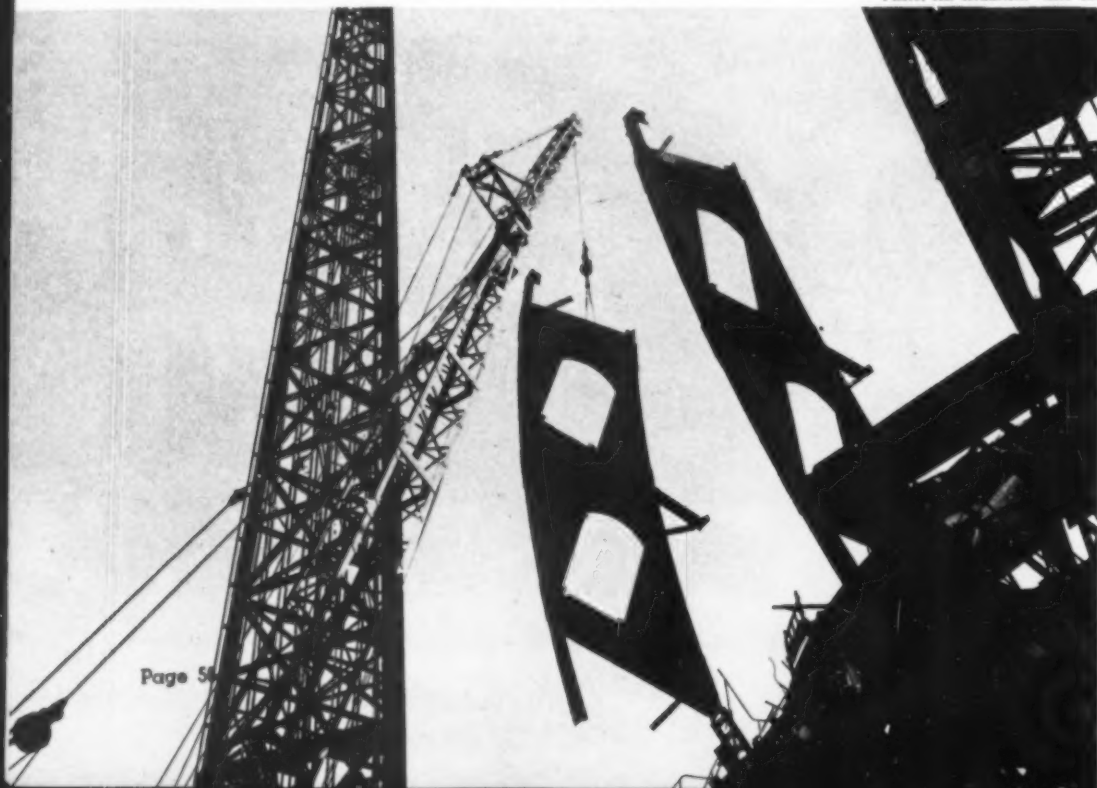


RIVETED FRAMES of Trylon and Perisphere call for burning with oxyacetylene torches to remove more than 3,000 tons of steel in these two structures.

Photo, Air Reduction Sales Co.

MERIDIAN TRUSSES (below) of 180-ft-diameter frame, weighing 2,000 tons in all, are cut into sections with gas torches and are lowered to ground by cranes.

Photo, Air Reduction Sales Co.



NATIONAL DEFENSE gave new meaning to the stripping of the site of the New York World's Fair; salvaged materials from the demolished structures of The World of Tomorrow have gone to the Army, Navy and industrial manufacturers to speed completion of camps, yards, bases, factory buildings and orders for armament and munitions. The salvage provided bolted steel framing for shops and storehouses, scrap steel for remelting and conversion to needed plates and shapes, lumber and wallboard for camp buildings, lavatory and plumbing fixtures for naval establishments, and a wide range of other ready-made units for defense projects. Demolition and dispatch of materials proceeded rapidly, in accordance with the requirements of original agreements between the Fair Corporation and the New York



• For National Defense Uses Salvaged Material Includes:

•
Bolted steel framing for shops and storehouses

•
Scrap steel for remelting and conversion to plates and shapes

•
Lumber and wallboard for camp buildings

•
Plumbing fixtures for naval establishments

•
Piping for army and navy bases

City Department of Parks, which has charge of the 1,200-acre Flushing Meadow Park occupied by the Fair.

After signing contracts for structural demolition and rehabilitation of the site immediately after the close of the Fair last fall, wrecking companies concentrated equipment and manpower on the job to complete the work in four-month and six-month periods designated for different areas of the park. Buildings of the Fair Corporation and of several private exhibitors were removed by the Albert A. Volk Co., New York City. This firm's work involved both typical methods on standard structures and special operations on the Trylon and Perisphere.

Volk's contract with the New York World's Fair, Inc., signed Oct. 28, the day after the closing of the Fair, was a voluminous document 357 pages in

length. By its provisions, about half of the included area had to be cleared, graded and made ready for planting in four months; the remaining area covered by the contract had to be similarly graded, stripped and top-soiled in six months. To assure adequate depth for the Park Department's planting, removal of all foundations was required to 4 ft. below grade. Total inclosed space in buildings included in the contract amounted to about 65,000,000 cu.ft.

Despite severe weather conditions encountered during parts of the winter, and a truck drivers' strike which caused a two-week set-back at the start, the contractor completed the work on schedule in both the four-month and six-month areas without making any request for a time extension provided by a strike clause in the contract. In early stages of the work scattered delays were encountered in obtaining entry to some Fair Corporation buildings from which private exhibitors had not removed their displays, and this condition caused a dispersion of wrecking efforts not conducive to best demolition speed. These

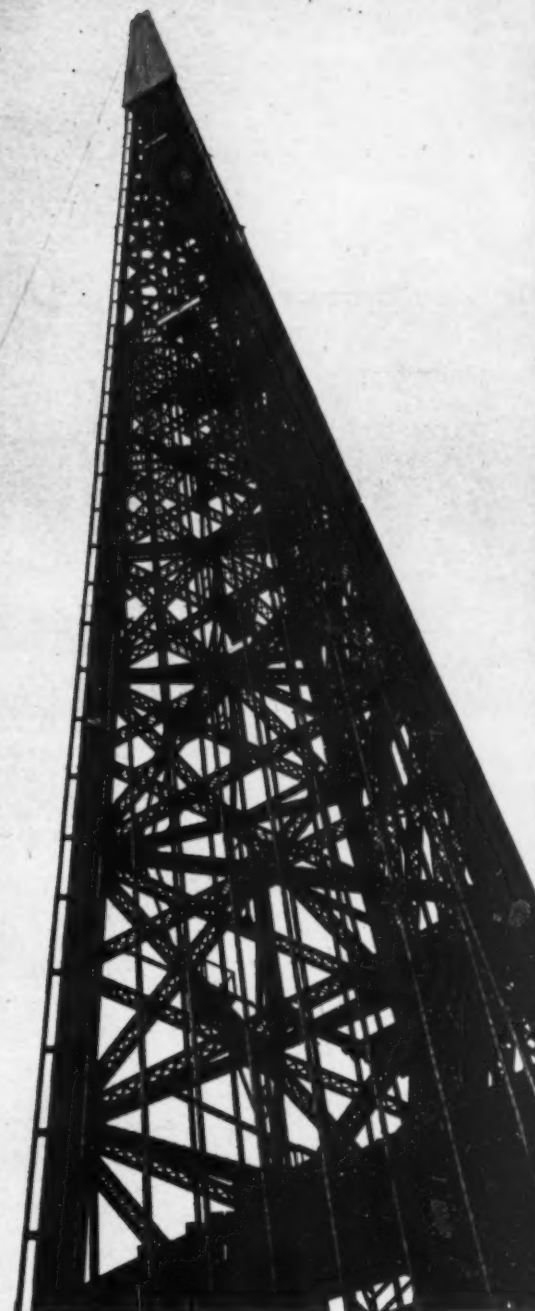
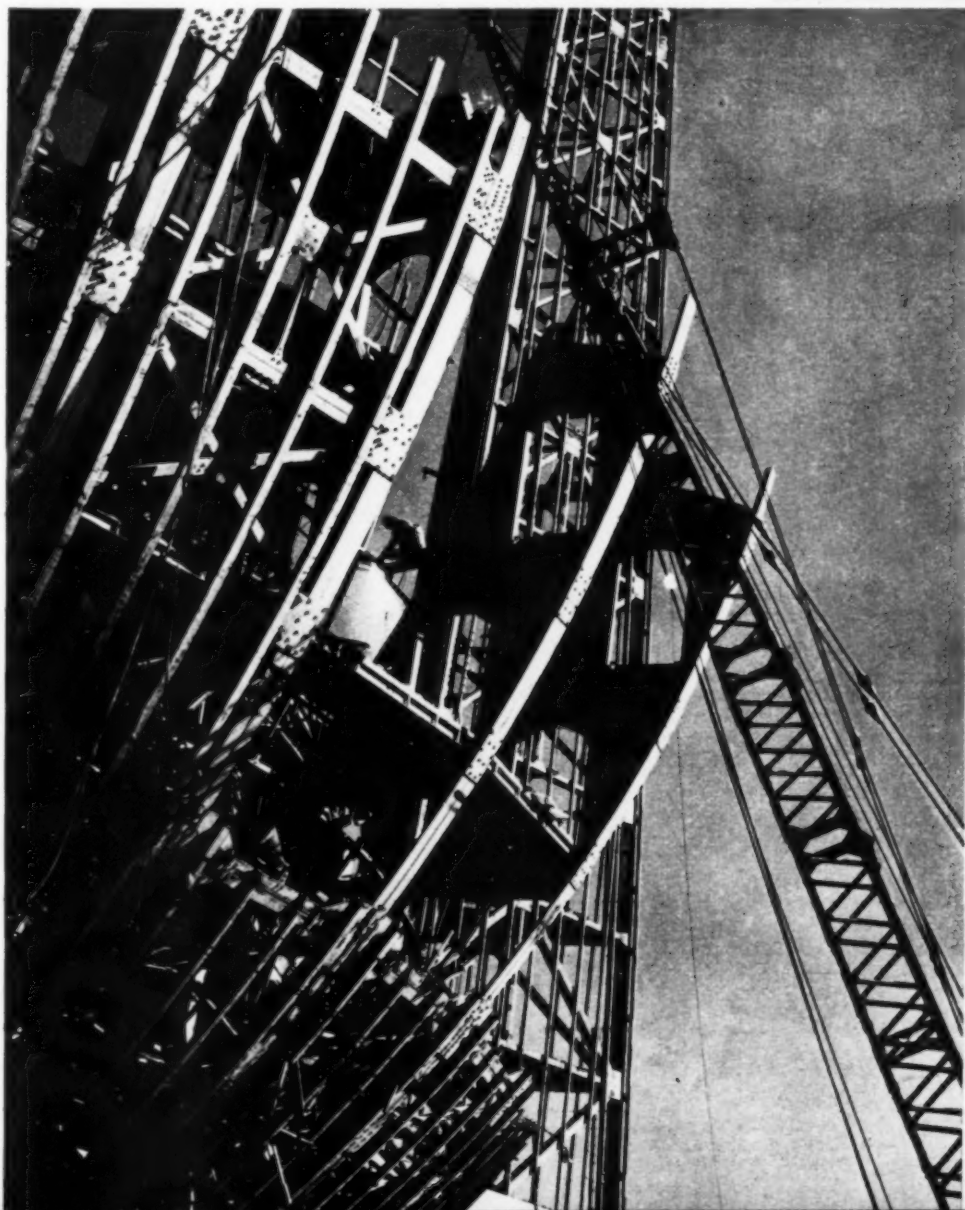
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DEMOLITION CONTRACT of Albert A. Volk Co. is executed under direction of **CHARLES FLESCHNER**, secretary, in charge at site.

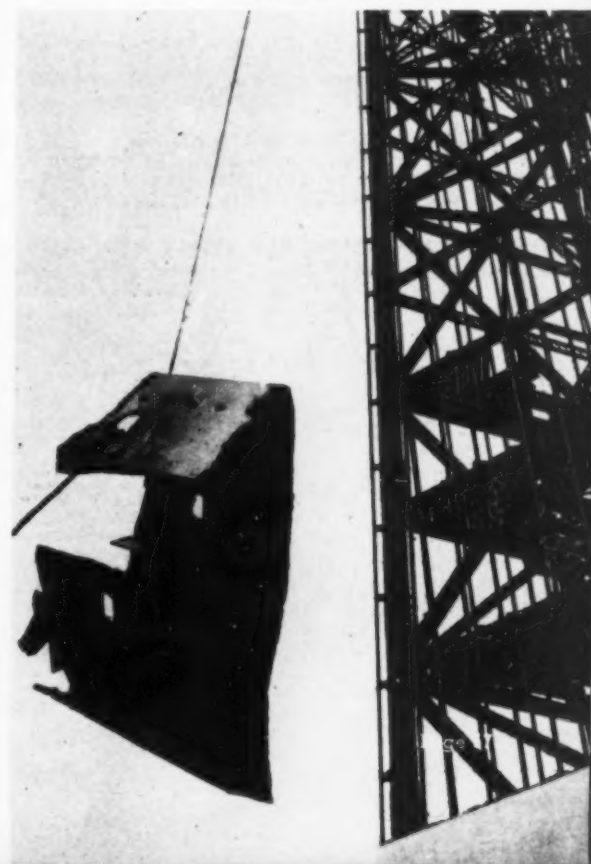
USING OXY-ACETYLENE TORCH (below), ironworker cuts framing member of Perisphere skeleton near riveted connection. During earlier demolition of upper part of spherical frame, dismembered sections were allowed to drop into bowl-shaped basket formed by bottom of structure, without use of cranes or other hoisting equipment. From level somewhat above horizontal diameter down to completion of demolition, cranes are employed to take hold of parts before they are severed.

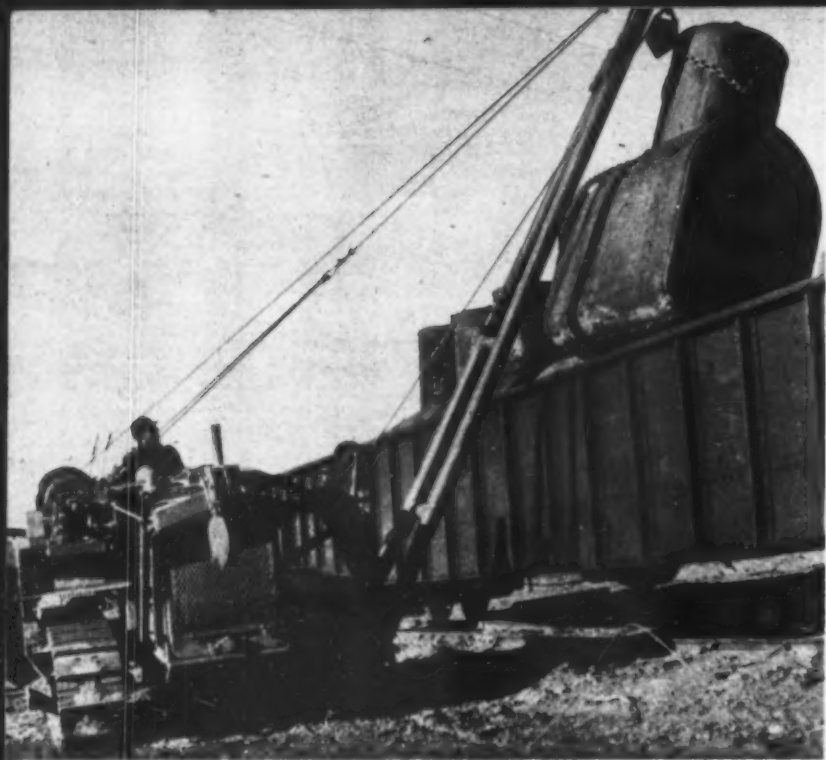
Photo, Air Reduction Sales Co.



FROM SLENDER TIP of 610-ft. Tylon (above and below), flame-cut steel pieces are lowered to ground by hoist line reeved through sheave block attached to one of three column legs of structure.

Photos, Air Reduction Sales Co.





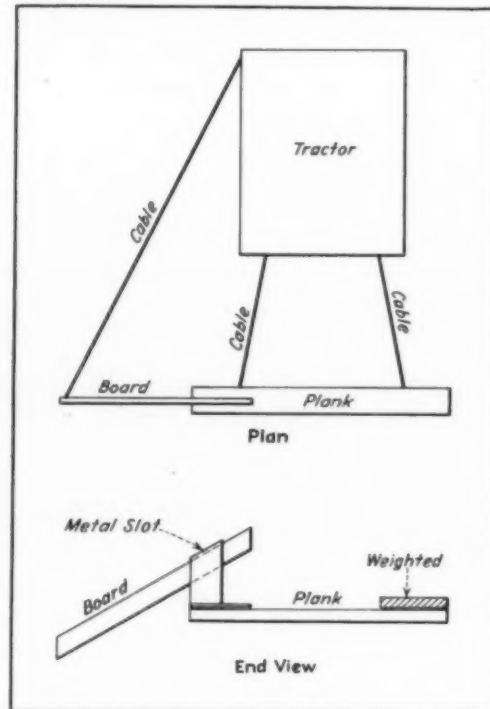
SIDE BOOM RIG ON TRACTOR solves problem of carrying and loading boiler scrap steel rapidly into gondola railway cars, without rehandling. Equipment consisting of Caterpillar diesel tractor and Trackson pipe-layer attachment operated by winch is used by American Iron & Metal Co. of Casper, Wyo., for handling 75,000 tons of scrap steel for quick delivery. Rig can handle 30-ton load.



COMPLETE INCLOSURE of ready-mixed concrete plant at East Alton, Ill., enables Hoeftken Bros. Construction Co. to maintain "business as usual" during severe winter months. Bay City 1-yd. crane with 50-ft. boom, feeds aggregates to Heltzel bins and batching equipment which is protected by panels of Johns-Manville siding.



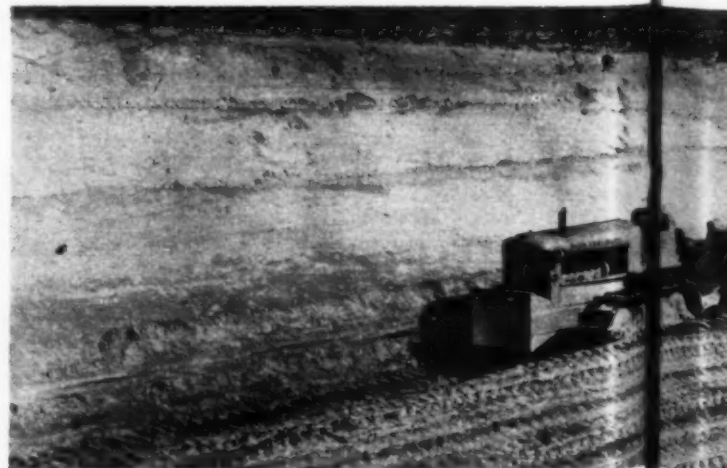
FINISHING SLOPES on highway fills composed of fine, loose sand is done with this rig consisting of adjustable inclined screed plank mounted on Caterpillar tractor, as illustrated in sketch at right. To plank dragged by tractor is bolted heavy metal leg with slot at proper slope angle to carry screed. Cable runs from lower end of screed to front end of tractor. Device was employed by Frank Penepacker on Oregon state highway contract.—Photo and sketch from HENRY JULLUM, Salem, Ore.



SPIKING, BOLTING AND BORING, in connection with laying track on relocated Southern Pacific Railroad around Shasta Reservoir, is done with this air-driven rig operated by contractor (combination consisting of United Concrete Pipe Co., A. Teichert & Sons and Ralph A. Bell).

Gasoline-engine-driven Ingersoll-Rand Compressor unit, together with receivers and accessories, is shown mounted on two pushcars. Air is stored at about 100 lb. per square inch.

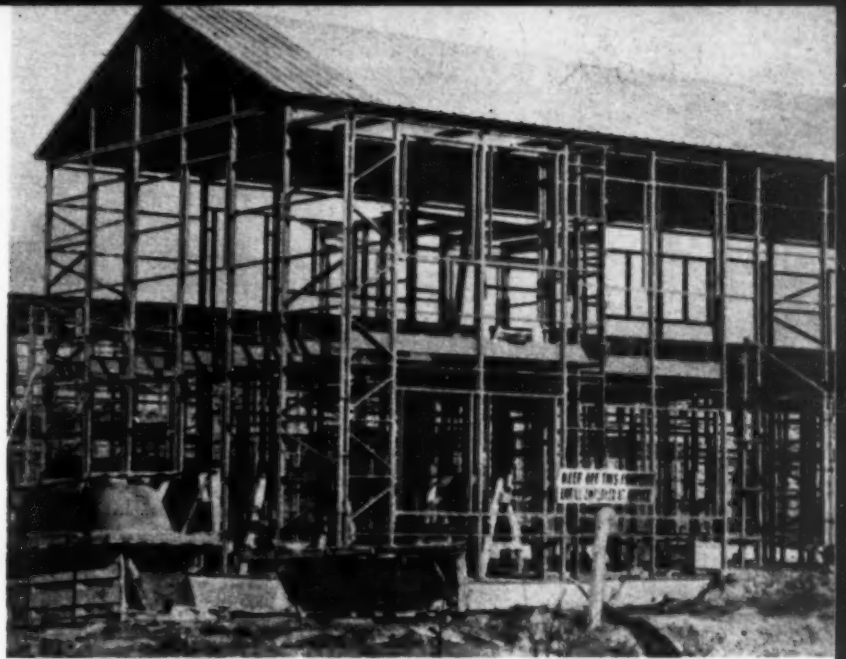
Ordinarily four tools are used in driving spikes, and rig advances with one tool working on either side of either rail.



HOW *They Did It*

CONSTRUCTION DETAILS

*For
Superintendents and Foremen*



PREFABRICATED STEEL FRAMING, claimed to have high salvage value for disassembly and re-use, supports 8-in. second-floor joists and light trusses under metal roof in patented Stran-Steel construction employed by Bureau of Yards and Docks of Navy Department for housing project comprising 1,042 family units erected by Byrne Organization, Dallas, Tex., adjacent to U. S. Naval Operating Base, Norfolk, Va. Project includes 81 two-story buildings containing 1,020 living units and eleven one-story houses for remaining 22 units. Total cost of complete project, including installation of all utilities and kitchen equipment, is estimated to be about \$2,284,000.

Wide World Photo



PUSHING 36-IN. CONCRETE PIPE (right) distance of 70 ft. under railroad tracks is accomplished with aid of pair of Greenlee 75-ton hydraulic pipe pushers. As open end of pipe is shoved forward, earth is removed from inside by scoop and sewer rods. Pusher consists of hand-operated hydraulic unit with six operating speeds for varying soil conditions. As pressure is applied by pumping handles, unit moves forward on notched steel base.

RUBBER COMPOUND IS HOT-POURED (left) to seal joint between concrete pavement slabs. Product known as Rai-Seal is recommended by its makers as top seal for depth of 1 to 1½ in. over preformed filler strip. Available in either black or in gray color to match concrete, rubber compound is melted in ordinary asphalt kettle at 400 to 450 deg. F. Among advantages claimed for this joint seal are adhesion to concrete surfaces, resiliency at low temperatures and non-flowing properties.



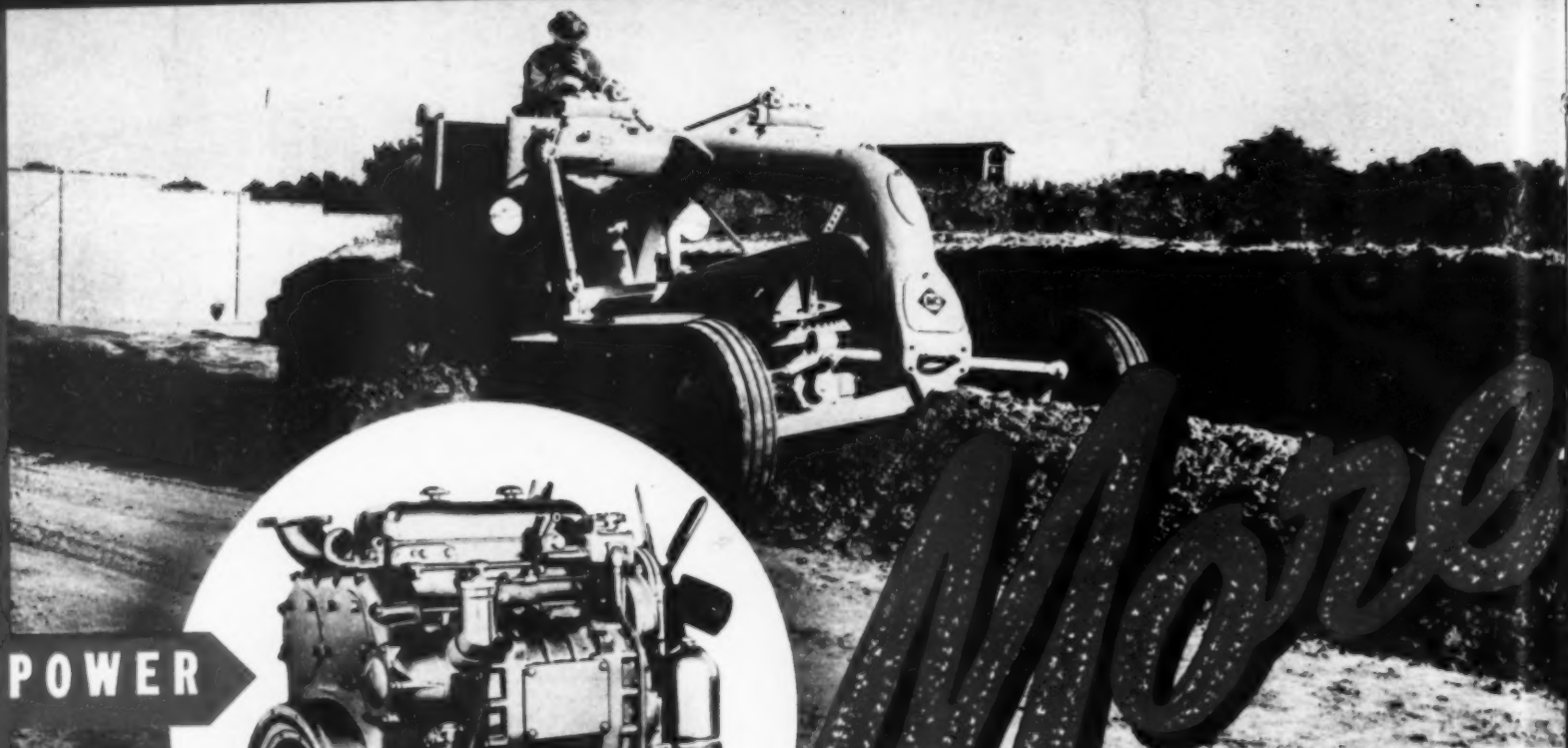
PUSHER PLATES (below) on forward ends of Allis-Chalmers diesel tractors facilitate loading, in unison, of two Gar Wood scrapers on county road job near Battle Creek, Iowa. Contractor is Ira Van Buskirk, of Howarden, Ia.



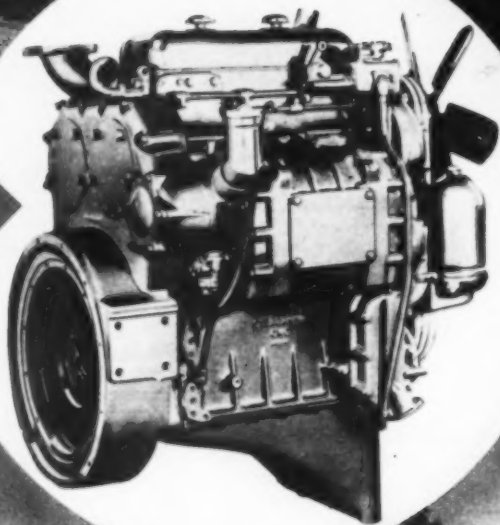
WOOD TRUSSES OF 100-FT. CLEAR SPAN (below), spaced 20 ft. on centers and fabricated with aid of timber connectors, support Transite roof of 120x528 ft. building erected by Drackett Co., of Cincinnati, Ohio, to take place of silos for storage of soya beans. Trusses were assembled in two half-sections and erected by two cranes. Labor cost per M ft., b.m.; with carpenters at \$1.45 per hour, common labor at 75c. per hour, and hoisting engineer at \$1.75 per hour, were as follows: Fabricating, bolting up and assembling, \$27.30; erecting in place, \$3.40; total, \$30.70. Total cost of structure amounted to 7.4c. per bushel of storage capacity, as compared with cost of 14c. per bushel of capacity for silos, according to National Lumber Manufacturers Association.



YOU GET ALL "3" WITH THE MODEL "AD"



POWER



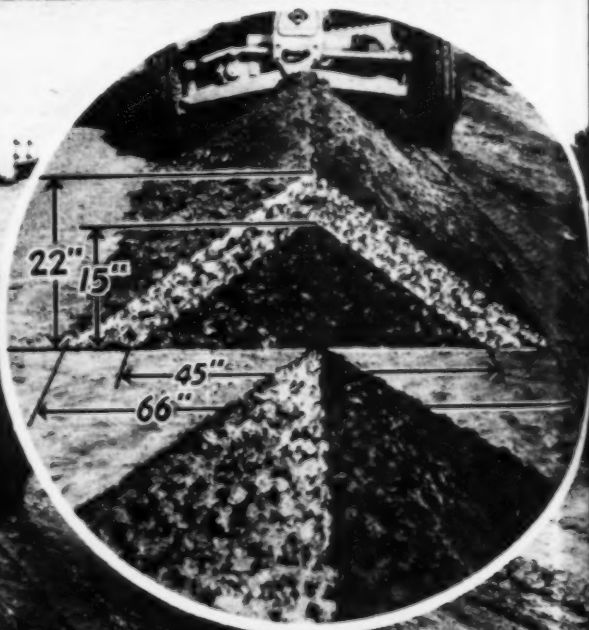
More



TRACTION



CLEARANCE



Capacity

BECAUSE:

More
POWER!

The push behind the blade first depends on the power of the engine. How much energy does the engine develop, how does it act under overloads? These factors determine the kind of work you can handle with your grader and the speed with which you can do each job. The model "AD" develops 75 Diesel brake h.p.—more energy packed in this grader than any other outfit ever built. Smooth power—so quiet it sounds almost like a regular auto engine. Hangs on to overloads with the tenacity of steam power—reserve torque enables you to throttle down to half speed without decreasing the load on the blade. In addition, starts instantly . . . operates on ordinary Diesel fuels.

More
TRACTION

No matter how much power you pack into a grader it doesn't mean a thing unless you have the traction to make use of it. To get this necessary traction you need to balance your machine so that a greater part of the weight will fall on the rear wheels. That is exactly how the "AD" motor grader is balanced. A higher percentage of its 21,500 lbs. falls on the rear wheels than does that of any other motor grader. It assures you that all the energy from the "AD's" powerful engine is going where it belongs . . . right to the blade. This enables you to handle the hardest kind of work with unusual ease—from deep, tough scarifying to high, heavy bank cuts.

More
CLEARANCE

Power and traction alone is not enough. You must have ample clearance. In fact, a motor grader's capacity is limited by its clearance. When material pushes up into the axle or circle you are pushing it instead of rolling it. This sets up resistance . . . therefore causes power loss. That's why the "AD's" extra clearance under the front axle and circle is so important. Enables it to handle twice as much dirt as ordinary graders. This is proved by a cross-section of a windrow marked off in triangles comparing the "AD" capacity with other graders—note lower left photo. Figure out the areas—prove it to your own satisfaction. You will find that the "AD" handling a 22" windrow moves twice as much dirt every foot it travels as do ordinary graders moving only 15" windrows.

More power plus more traction plus extra windrow clearance and a full range of blade positions gives the "AD" an earth-moving capacity the like of which you've never before known.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE • U. S. A.

MODEL "AD" 2-CYCLE DIESEL MOTOR GRADER

Army Camp Paving AT FORT ORD INCLUDES



Heavy-Duty Paving



SPREADING AND "HAND SPOTTING" were initial operations for first course of penetration macadam stone.



TWO ROLLERS AT WORK, one before and one after first shot of asphalt.



ASPHALT PRESSURE DISTRIBUTOR places first application of hot material.



TRUCK SPREADS KEY ROCK on road flanked by camp buildings.

MORE THAN 400,000 SQ.YD. of asphalt penetration macadam, 3-in. thick, has been placed in main streets and truck parking areas in the speedily constructed cantonment at Fort Ord, Calif., described in *Construction Methods* for April, p. 60. All main roads and streets as well as two large truck parking areas have been paved with this heavier asphaltic macadam, the area being the equivalent of some 30 mi. of 24-ft. roadway. The two truck parking areas occupy 40 and 10 acres respectively and the main roads and streets total 201,340 sq.yd.

Heavy-Duty Paving

The natural soil at Fort Ord is sandy, varying from well-graded sandy loam to clean sand of virtually one size. Over this, after grading, a 6-in. layer of dense-graded crushed rock (2½ in. to dust) was laid as a base course, thoroughly watered and compacted. This base was allowed to dry out before putting on the first asphalt.

The prime asphalt coat consisted of two applications of ½ gal. each of SC-1A grade liquid asphalt (approximately equivalent to the new SC-1 grade). Sand was applied to take up any "wet" spots which remained after the liquid asphalt had been allowed to penetrate.

The penetration macadam was placed in four courses totaling 3 in. in thickness after compaction. The SC-6-grade liquid asphalt, which is in reality a soft grade of paving asphalt, was used as the binding medium. Following are the quantities and sequence of application:

180 lb. per sq. yd.	2½x1¼-in. stone
¾ gal. per sq. yd.	SC-6 asphalt
90 lb. per sq. yd.	¾x¾-in. stone
½ gal. per sq. yd.	SC-6 asphalt
20 lb. per sq. yd.	¾-in.x10 mesh
¼ gal. per sq. yd.	SC-6 asphalt
25 lb. per sq. yd.	fine screenings

Granite rock shipped in from the Logan Quarry near Watsonville was used. This rock is particularly favorable for penetration macadam because it is hard, angular and has a rough texture surface. The first course of penetration macadam stone was distributed by three spreader boxes; the strike-off plates of the outside two were adjusted to give the necessary slope, while the strike-off plate of the center box was curved to effect roadway crown. Some hand smoothing was necessary behind the spreader boxes.

Initial compaction of the coarse rock was accomplished with a three-wheel, 10-ton roller, following which an application of ¾ gal. per square yard of SC-6 asphalt heated to 375 deg. F. was made. Over the freshly spread asphaltic material the base course again was compacted with an 8-ton tandem roller to replace any stones disturbed by the distributor wheels. To prevent pickup of the asphalt, the roller wheels were sprayed lightly with water.

Next came the key rock, which was

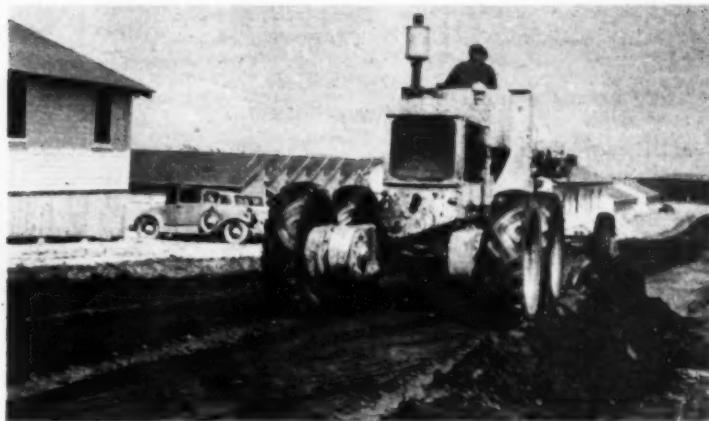
(Continued on page 113)

LIGHT- AND HEAVY-DUTY BITUMINOUS TYPES

Light-Duty Paving



LIQUID ASPHALT is applied to sand windrows. This is first of three operations and requires presence of asphalt supply truck (in background). In two later operations mixer (Gardner traveling pug-mill type) effects a thorough admixture after which a blader spreads mix over road bed.



MOTOR GRADER blades sand-asphalt mixture to uniform depth.



CONDITION OF SURFACE when spreading of mixed material has been almost completed.



PRELIMINARY ROLLING always is done with pneumatic tires because of kneading effect they have on soft material.

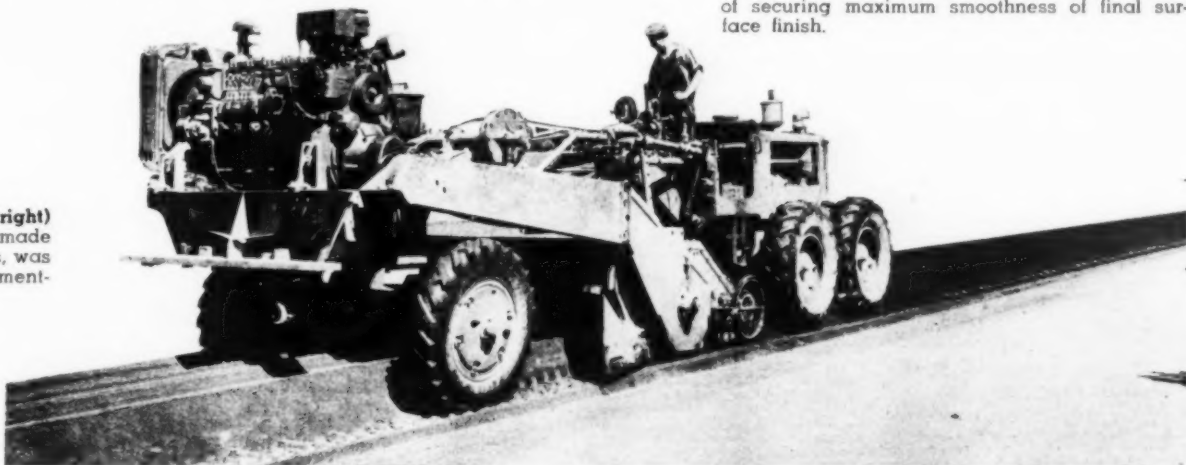


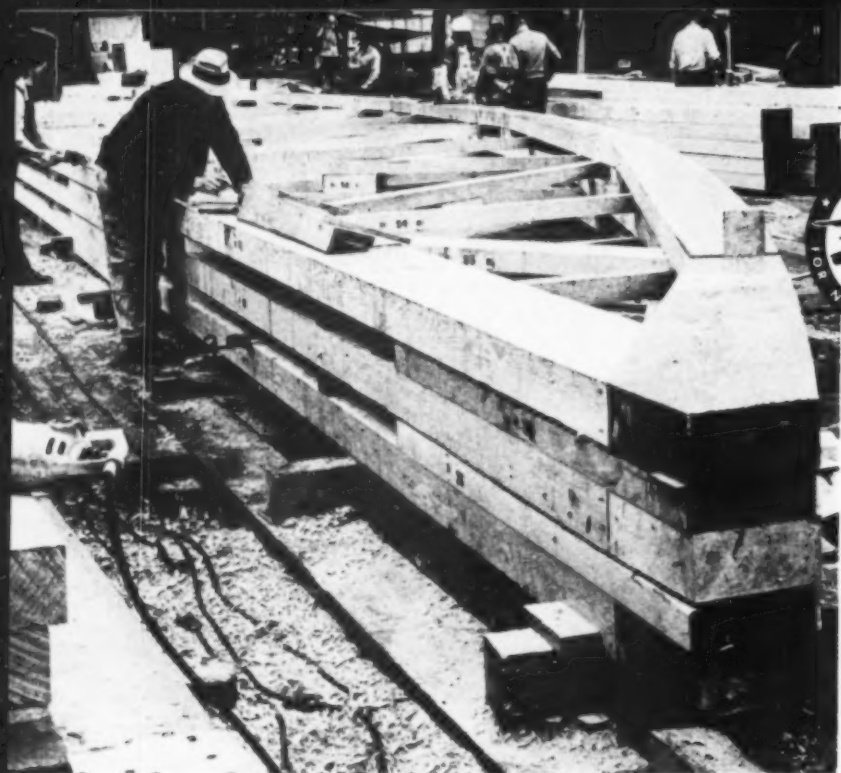
APPEARANCE OF SURFACE after first light rolling and subsequent surface blading to smooth out any minor irregularities. Final blading is considered important to assure ultimate smoothness.



FINAL COMPACTION is here being made with pneumatic tires, although flat rim (steel) tire ordinarily is recommended for finishing as means of securing maximum smoothness of final surface finish.

LATER-MODEL MIXER (right) of traveling pug-mill, made by Geo. Gardner & Sons, was used on this job, supplementing older models.





PREFABRICATION OF BOWSTRING TRUSSES of 140- and 100-ft. spans is done at Portland, Ore., prior to knocking down and shipping to aircraft plant at Wichita, Kan.



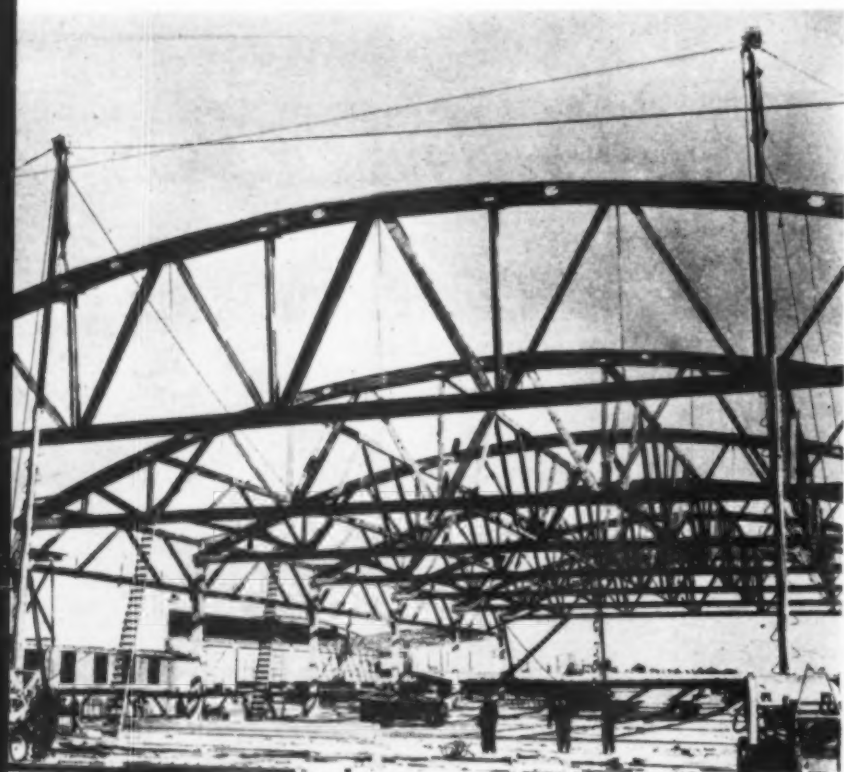
Long-Span Timber Trusses

Prefabricated and Shipped by Rail, Support 8-Acre Roof for Aircraft Plant

PREFABRICATED IN PORTLAND, ORE., knocked down and shipped by rail to Wichita, Kan., a distance of more than 1,500 mi., timber trusses of Douglas fir ranging in clear span up to 140 ft., are the outstanding structural feature of the enlargement of the plant of the Beech Aircraft Corp., which is producing planes for the U.S. Army Air Corps. The use of timber connectors in fabricating the big trusses, it is claimed, was responsible for reducing the loss of camber to an almost imperceptible amount, even in the longest trusses. Selection of timber trusses for the rush job was influenced by two factors; speed of erection and low cost. Prefabrication was done by Timber Structures, Inc., at its plant in Portland, Ore.

Under the necessity of speeding production of planes to make deliveries called for by defense contracts, every day counted in the early completion of the Wichita plant expansion.

(Continued on page 102)

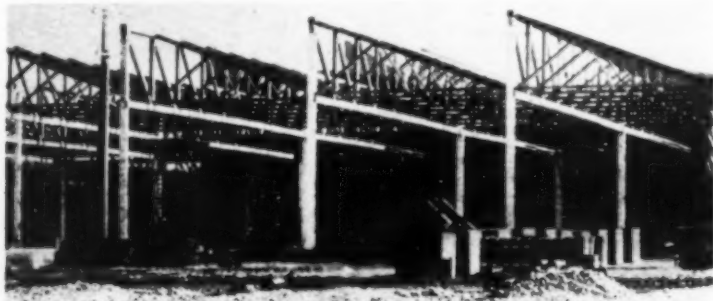


ERECTION OF BIG TIMBER TRUSSES at 8-acre plant building site is done with aid of mobile gin-pole rigs on truck mountings.

CLEAR FLOOR AREA in new aircraft building (below) is provided by use of timber trusses of 140-ft. span carried by glued laminated columns.



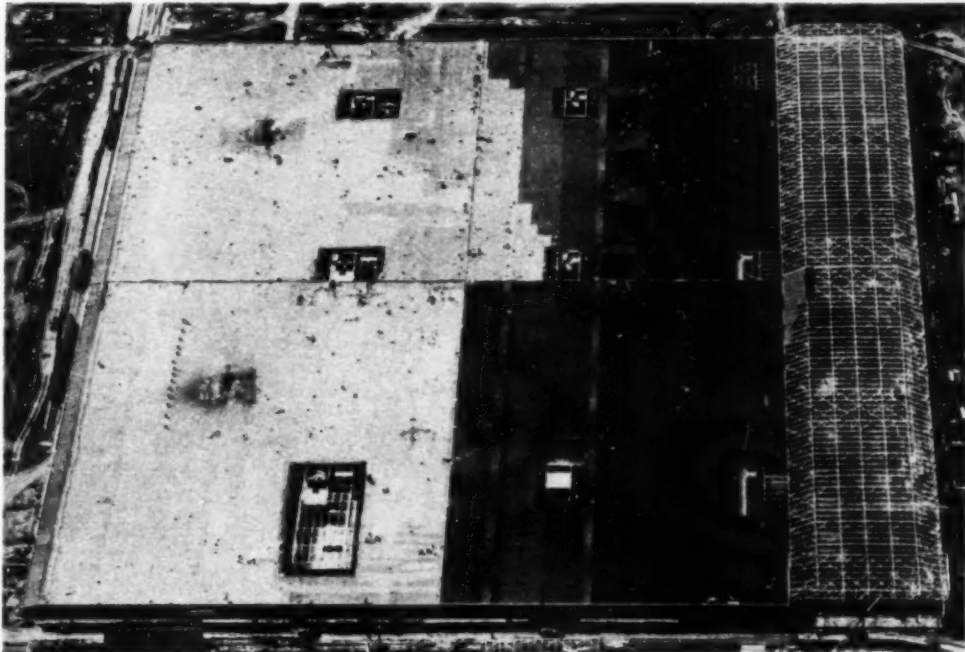
USE OF TIMBER CONNECTORS for trusses required forming of grooves for 4-in. flush type metal shear plates for attachment of web members to steel gusset plates.



FLAT HOWE TRUSSES of 100-ft. span, also prefabricated, were spaced on 33-ft. centers.



INSULATED SIDEWALL PANELS are prefabricated of cellular sheet steel units 24 in. wide to which are attached 2½ in. of fiberboard and thin steel sheet serving as interior finish.



20-ACRE AREA is covered by main assembly building of North American Aviation plant at Dallas, Tex. Built-up roofing is being laid on cellular steel deck carried by light trusses as shown at right end of structure.



INTERIOR OF STEEL WALL UNITS is surfaced with thin steel sheets, aluminum-painted.

STEEL ROOF DECK (below) consists of cellular sheet steel units carried on light trusses and purlins.



WINDOWLESS WALLS in "blackout" design are formed of prefabricated units of cellular sheet steel, 24 in. wide, extending from 12-in. thick concrete base to roof line



20-ACRE AIRCRAFT PLANT

Built in 130 Days

COMPLETED IN ONLY 130 WORKING DAYS, 30 per cent under scheduled time, the new \$7,000,000 bomber assembly plant of the North American Aviation Corp. at Dallas, Tex., providing a million square feet of factory space to speed up production on national defense orders, was formally dedicated April 7. Designed as a "blackout" structure, the huge main building, with a floor measuring 904x954 ft., is windowless, air-conditioned, and is inclosed with walls and roof of prefabricated cellular steel insulated structural units. Lighting is provided by fluorescent lamps. The structure, consists of 50-ft. bays (except

(Continued on page 117)



NEW DIVISIONAL HEADS of Associated General Contractors of America are: (left) H. A. DICK, Portland, Ore., chairman, Heavy Construction and Railroad Division; (center) MATTHEW J. CUMMINGS, Boston, Mass., chairman, Building Division; (right) FRANKLYN C. NELCH, Springfield, Ill., chairman Highway Division.

Present and Accounted For A PAGE OF PERSONALITIES



CONTRACTOR HONORED by Columbia University's Engineering Alumni Association is LAZARUS WHITE, '97 president of Spencer, White & Prentis, Inc., specializing in foundations and heavy construction. Mr. White (center) receives Eggleston Medal for "distinguished engineering achievement" from FELIX E. WORMSER, association president, as Dean Joseph W. Barker of Columbia's School of Engineering looks on.

Wide World Photo



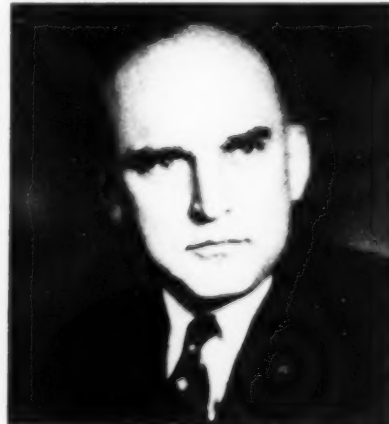
"HAVING WONDERFUL TIME"—and who wouldn't in such company—might well be report of MAJOR IRVING V. A. HUIE, newly appointed WPA administrator for New York City and formerly Commissioner of Public Works, as he attended annual frolic of The Moles, organization of New York tunnel and heavy construction men.



GOOD HUMOUR AND COOPERATION, registered in this snapshot, have marked relations between W. N. EVANS, (right) project manager for L. E. Dixon Co., contractor on Camp San Luis Obispo, and K. L. PARKER, general superintendent. Job for Army involves canvas covers over 4,387 tent frames each designed for 5-man occupancy.



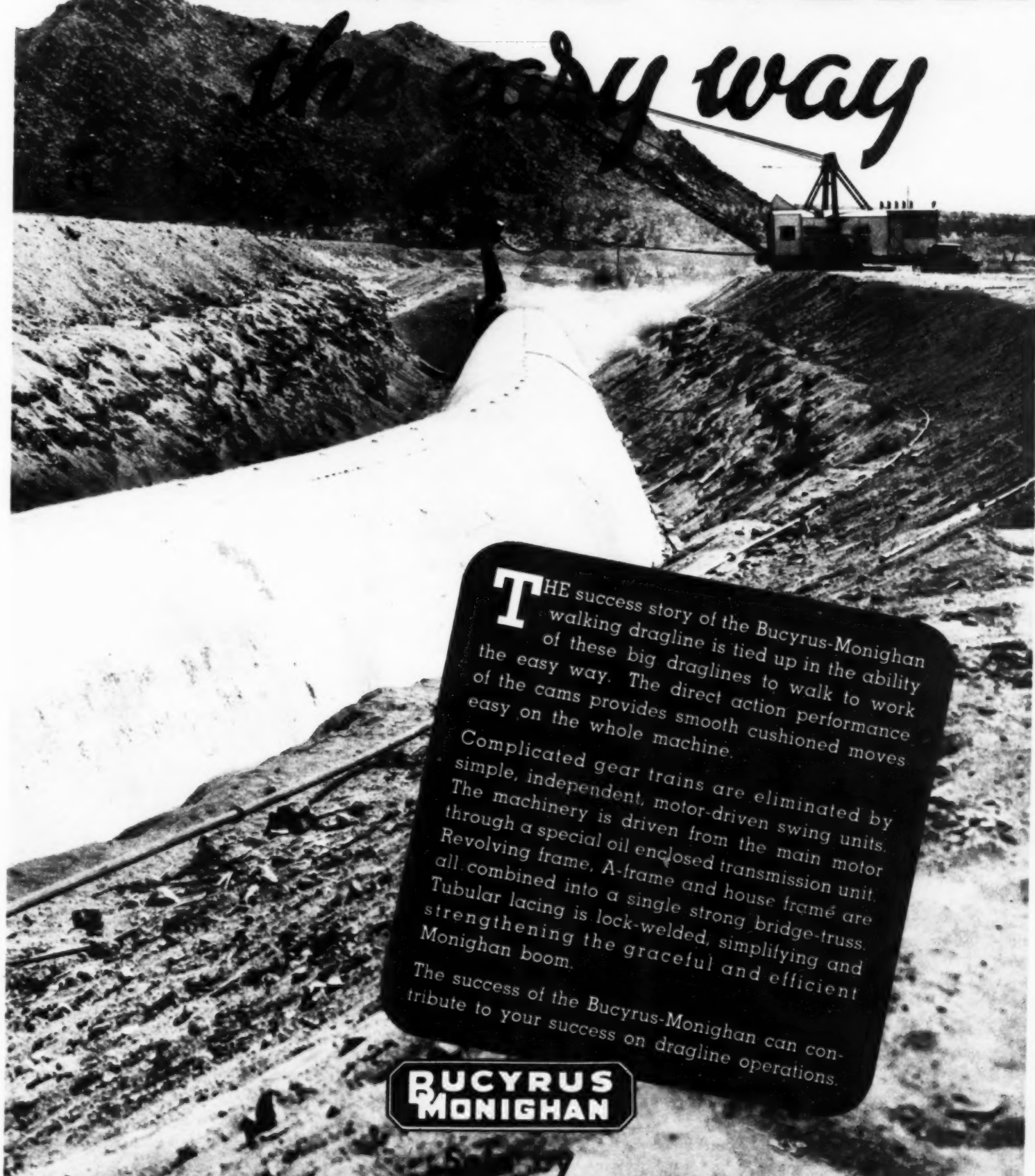
NEW PRESIDENT of Colorado Association of Highway contractors is CHARLES B. BERRY, secretary-treasurer of Hamilton & Gleason Co., of Denver, pictured above in hard-boiled hat during inspection of 500,000-cu.yd. overburden stripping operation for Climax-Molybdenum Mining Co.



ACTING CHIEF SUBWAY ENGINEER of Chicago's Department of Subways and Superhighways is CHARLES E. DE LEUW, appointed recently to fill vacancy caused by return of Ralph E. Burke to his position of chief engineer of Chicago Park District, from which he was on leave of absence. Mr. DeLeuw, graduate of University of Illinois, had formerly served as consulting engineer on Chicago subway project.

Walks to Work

the easy way



THE success story of the Bucyrus-Monighan walking dragline is tied up in the ability of these big draglines to walk to work the easy way. The direct action performance of the cams provides smooth cushioned moves easy on the whole machine.

Complicated gear trains are eliminated by simple, independent, motor-driven swing units. The machinery is driven from the main motor through a special oil enclosed transmission unit. Revolving frame, A-frame and house frame are all combined into a single strong bridge-truss. Tubular lacing is lock-welded, simplifying and strengthening the graceful and efficient Monighan boom.

The success of the Bucyrus-Monighan can contribute to your success on dragline operations.

**BUCYRUS
MONIGHAN**

Bucyrus-Erie

S O U T H M I L W A U K E E , W I S C O N S I N

CONSTRUCTION EQUIPMENT NEWS

CONCRETE BREAKING MACHINES of two types, one mounted on swivel wheels for pushing around on job by hand, and other self-powered for travel by an air motor, are designed for demolishing concrete floors in buildings, pavements, breaking frozen ground in trenches, tamping and other uses. Both



types of rig, weighing 1,000 lb. and 1,400 lb. respectively, are equipped with steel A-frames and booms carrying cylinders having bore of 6 in. and stroke of 4 ft. within which an alloy metal shaft or piston, equipped with 128-lb. striking head, operates on air pressure supplied at from 75 to 80 lb. per square inch through 1 1/4-in. hose line by 210-cu.ft. portable compressor. Force of blow is from 9,000 to



10,000 ft.-lb. Dimensions of push type machine are: height, 8 1/2 ft.; width, 4 ft.; length, 7 ft. Larger self-propelled model is 8 1/2 ft. high, 7 ft. wide and 10 ft. long. It has longer swivel boom than push type machine, allowing it to make cut 7 1/2 ft. wide. These machines are claimed to have a breaking capacity of 500 lin. ft. per hour of 8-in. reinforced concrete 8 in. wide.—**Rapid Pavement Breaker Corp.**, 607 Degraw St., Brooklyn, N. Y.

★ ★ ★

PORTABLE CONCRETE MIXING PLANT of all-steel construction comprises 32-cu.yd. two-compartment aggregate bin, aggregate hopper and bucket elevator, weight batching apparatus, siphon-type water measuring tank and 14S mixer fed by power-driven screw conveyor which delivers mixed sand, gravel and cement into drum. Plant is made ready for moving by: (1) folding down bin sides and hinged

For Safety Sake, Specify **"VULCAN" HOIST HOOKS**

Williams' "Vulcan" Hoist Hooks are drop-forged from selected steel and specially heat-treated to increase their strength and toughness and to reduce liability of breakage. Each Hook is individually proof-tested to 50% beyond its rated "safe working load." You can identify "Vulcan" Hooks by the orange tip. Made in both Shank and Eye patterns up to 25 tons capacity.

Eliminate needless hazards by demanding Williams' "Vulcan" quality. Sold by industrial and contractors' supply houses everywhere. Write for illustrated literature.





**"We speed up our job
with *Gulf*
Quality Lubricants"**

... says this contractor*

**"By following the Gulf Engineer's recommendations
we get dependable, efficient performance
from all our machines"**

"WHEN we started this job we insured as well as possible against delays caused by mechanical troubles—we standardized on Gulf quality lubricants," says this contractor. "The extra hours of trouble-free service we gain are playing an important part in keeping us ahead of contract schedule."

Call in a Gulf engineer before you start *your* next job

—he can help you finish it more quickly and with a bigger profit. No matter where your job is located, you can quickly secure Gulf quality lubricants from one of the more than 1200 warehouses in 30 states from Maine to New Mexico. Phone or write your nearest Gulf office today.



GULF OIL CORPORATION • GULF REFINING COMPANY
GULF BUILDING • PITTSBURGH, PA.



On-the-job photo of a Gulf engineer (left) discussing lubrication of earth-moving equipment with construction superintendent.

*Laub & Collins, General Contractors, are relocating a section of Route 22 (William Penn Highway) near Wilkinsburg, Pa. Gulf lubricants are helping to protect their modern equipment 16 hours a day.

PONY

Solid Shank
FEATHERWEIGHT
Shovels

**PERFECT
BALANCE**

A new redesigned socket gives to the PONY Solid Shank Shovel the perfect balance which no other solid shank shovel has.

Equipped with
**SHOCK
BAND**

The famous ABW Shock Band gives to the shovel greater handle strength. This is a patented feature of PONY Solid Shank Shovels.

Ask Your Jobber

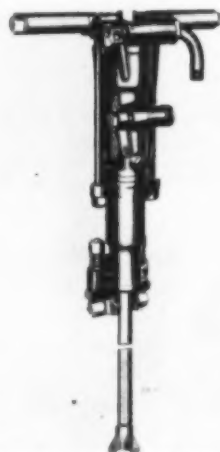
AMES
Since
1774

AMES BALDWIN WYOMING CO.
Parkersburg, W. Va. North Easton, Mass.

ABW PRODUCTS
SHOVELS FORKS
SPADES HOES
SCOOPS RAKES
POST HOLE DIGGERS
AGRICULTURAL HANDLES



elevator to reduce height to 12 ft. 2½ in., (2) installing dual pneumatic-tired wheels on one-piece rear axle, and (3) backing ordinary truck tractor under front-end gooseneck to pick up plant for transit. Overall length from forward end of gooseneck to rear edge of aggregate hopper is 22 ft. 2½ in.; width, 7 ft. 11½ in.; height to top of elevator when plant is set up for operation, 25½ ft. Four-cylinder 24½-hp. gasoline engine drives mixer and elevator through separate clutches. One-man worm-gear winch raises upper portion of elevator into operating position. Fast charging and discharging of mixer and use of time control device for mixing enable plant to produce large output. Weight is about 22,900 lb.—R. W. Fieroh Co., Inc., 3401 South Hoyne Ave., Chicago, Ill.



55-LB. ROCK DRILL, designated as "Easy Holding," is claimed to have many new features which make handling much easier on operator with consequent greater output on average drilling job. Vibration is reduced by refined valve action which results in economical use of compressed air. Another feature is easy opening, long life steel holder, either hand or foot operated, which is said to curtail greatly time and effort involved in changing drill steels. Additional improvements:

Drop-forged blower valve handle, large exhaust opening, two-piece chuck, thicker cylinder walls and large bearing surfaces within drill. Lubrication said to be exceptionally positive and thorough.—Ingersoll-Rand Co., Phillipsburg, N. J.

DRAFTING MACHINE, known as "Master-Drafto" has as special feature stainless steel protractor plate graduated in 2 deg. and set accurately for ½-deg. readings by use of graduated vernier. Graduations machine cut and may be read at glance. Protractor may be locked to any degree but for speed and convenience, it is fitted with

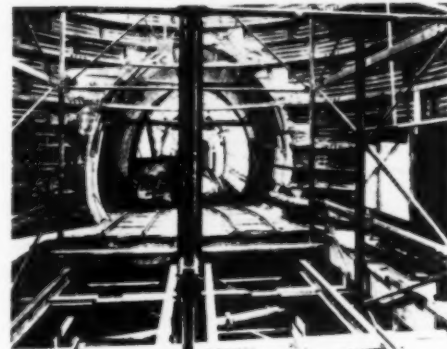


latching spring to lock scales at 0, 30, 45, 60 and 90 deg. on either side of 0 degree reading. Light in weight for ease of operation, Master-Drafto is said to be solidly built to stand hard use. Arms are constructed of seamless steel tubing, fitted with solid bearings. Scale blades are designed so that any scale, either boxwood or aluminum, can be inserted. These scales will fit tightly into blades without deviating from necessary 90-deg. angle. For center mounting machine on drafting board or table, cast aluminum bracket is used, containing screw for leveling scales parallel to drafting surface. Takes a maximum size sheet 24x36 in.—The Drafto Co., 141 Walnut St., Cochranston, Pa.

COMMERCIAL

**GIVES YOU EASIER,
FASTER, AND SAFER
CONSTRUCTION ON...**

**...LARGE SHAFTS and
CONNECTING TUNNELS**

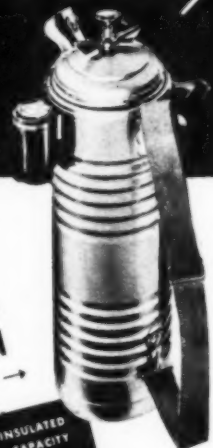


● In the accompanying illustration note these two **COMMERCIAL** advantages. First, the large diameter plates on the shaft, and the smaller ones on the tunnel ... both different in size and shape. This demonstrates **COMMERCIAL** variety. Second, note the lack of bracing ... a **COMMERCIAL** strength feature that brings safety, easier construction ... allows more actual working space. You can get these **COMMERCIAL** features on your next tunnel job, regardless of size, shape or condition of ground. So, choose these better Liner Plates. A letter will bring details.

**The COMMERCIAL SHEARING &
STAMPING CO.**
YOUNGSTOWN, OHIO

Economical-Safe-Sanitary

DOBBINS
SUPERBILT PORTABLE
DRINKING FOUNTAIN



**COOL-CLEAN-WATER
AND SALT GIVE
HEALTH & STRENGTH
TO YOUR WORKMEN**

Meets the requirements of all Public Health Authorities →

FULLY INSULATED
4 GAL CAPACITY

Saves Money on the Job

● Eliminates pails, kegs, dippers, individual cups. The Dobbins Portable Drinking Fountain and Salt Dispenser saves pay roll losses, prevents heat prostration, cramps, etc. Men on any job can now be assured the same protection from disease spreading drinking equipment that is afforded in modern plants.



SALT DISPENSER
Capacity 100 Tablets



● No. 3 Adjustable Waterproof
Shoulder Carrying Strap

● 3 WAY
MOUNTING
BRACKETS
For trucks and
tractors.
For inside and
outside use.

**NEW
ILLUSTRATED
CIRCULAR MAIL-
ED ON REQUEST**

OVER 150,000 NOW IN USE

DOBBINS MANUFACTURING COMPANY
FACTORY • ELKHART, INDIANA

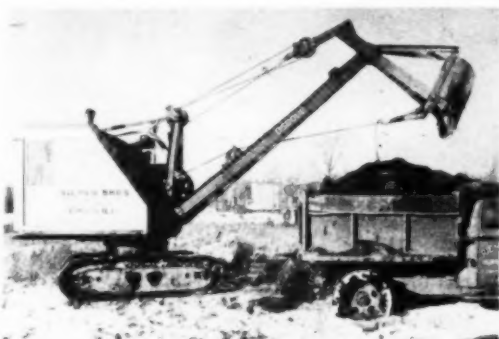
HIGH DISCHARGE TRUCK MIXER, designed for combination top or end loading, has "Hi-Up" drum rollers positioned under center of gravity of drum practically balancing load and relieving strain on front pedestal bearing. This provides machined drum track around center of drum which acts as reinforcing band where impact of intake load is



heaviest and eliminates long span of light steel drum shell to be found where drum track is at discharge end of drum and pedestal bearing at front. Absence of drum rollers at discharge end of mixer has shortened frame of unit and assured better mounting on truck chassis; and lack of supporting members required for drum rollers permits backing up of mixer closer to forms and discharging of load without use of chute, although two-piece chute is standard equipment.—**The Ransome Concrete Machinery Co., Dunellen, N. J.**

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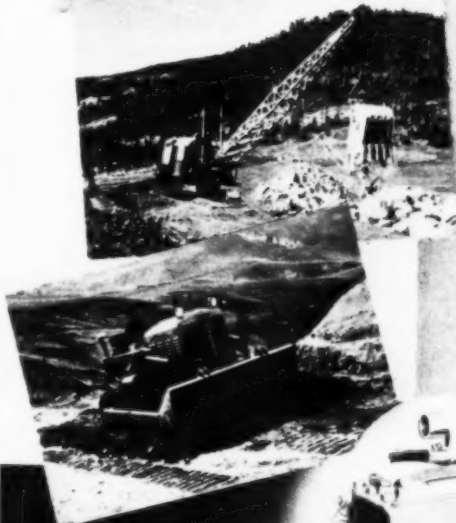
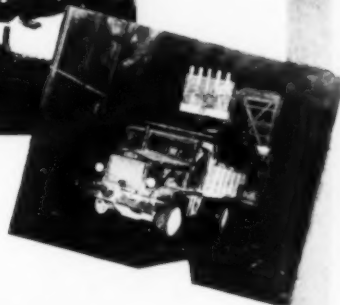
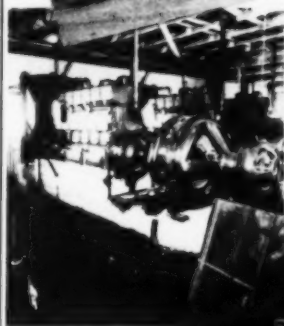
1/2-YD. EXCAVATOR features straight-line delivery of power and simplicity of operation, unnecessary parts having been eliminated and design simplified and balanced. Said to be convertible to all types of service and designed for crawler, standard truck and special wheel mounting. Powered either with gasoline or diesel engine. Power goes direct from engine to swing and travel shaft by triple strand roller chain, fully inclosed and equipped with sight



feed lubrication. Large-diameter wide-faced clutches and brakes on swing and travel shaft are controlled by hand lever, and those on drum shaft are controlled by "Servo" mechanism. All vertical shafts, reversing, swing, intermediate and travel, are recessed in deck and inclosed to keep out all foreign matter and to reduce wear and replacement costs. Boom hoist, mounted on left-hand side frame, has self-locking steel worm and bronze worm wheel. For shovel service, crowding sprocket is mounted on right-hand drum. Shipper shaft is above center of boom, giving increased working ranges. Vacuum dipper trip is operated by touch and located at operator's elbow. Streamlined cab, giving all-weather protection and full operating vision.—**The Osgood Co., Marion, Ohio.**

★ ★ ★

FIVE HEAVY-DUTY TRUCK MODELS feature new styling, cab comfort, foam-type sponge rubber seat cushions, easier steering, improved frame construction, larger, easier riding springs; rubber-mounted



**JUDGE THIS DIESEL
BY THE "COMPANY IT KEEPS"**

Note the list of nationally-known contractors who own and operate Cummins Diesel-powered road building

equipment—dump trucks, shovels, electric generating sets, compressors, concrete mixers or other types of machinery. These men know their diesels . . . know that Cummins Dependable Diesels can be relied upon for low cost horsepower hours . . . for uniform performance day after day, no matter how tough the going . . . how rigid the schedule. That's why you find Cummins Diesels "keeping company" with the big contractors on their most important jobs. Cummins Engine Company, 1716 Wilson Street, Columbus, Indiana.

BELOW: Model HB-600 Cummins Dependable Diesel, 150 hp. at 1800 rpm. Other models from 33 to 325 hp.

1. Peter Kiewit Sons Co.'s Super "C" Tournapulls moving 4,000,000 cu. yds. of earth at Fort Crook.

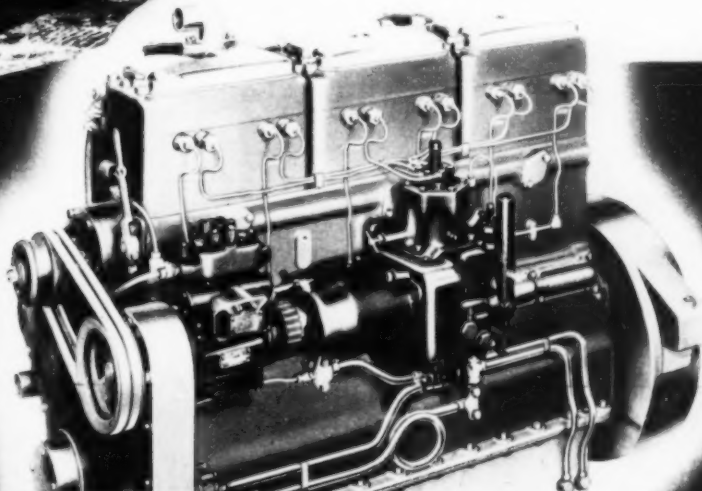
2. Morrison-Knudsen Company, Inc., Ogallala, Nebraska.

3. Arundel Corp., Siding Hill Tunnel, Pennsylvania Turnpike.

4. Guy F. Atkinson Co., Denison Dam, Denison, Texas.

5. Martin Wanderlich Construction Company, Pine River Dam, Bayfield, Colorado.

6. Warner Construction Company, Green Mt. Dam, Kremmling, Colo.



CUMMINS
Dependable
DIESELS

FOR Bigger PAYLOADS



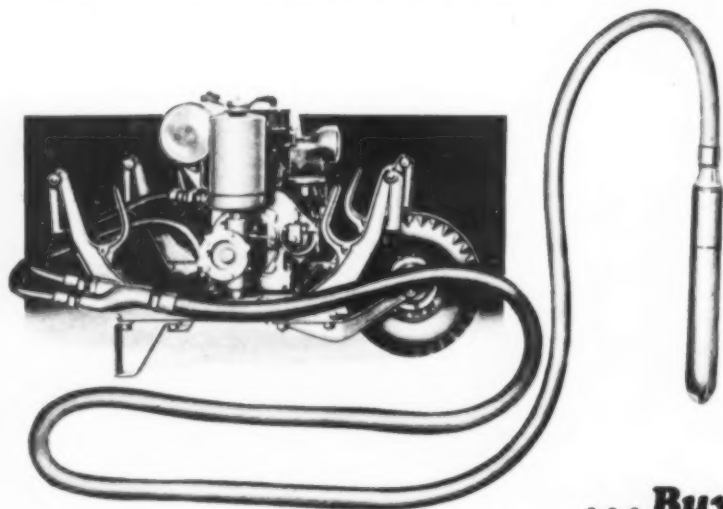
HAISS Hi-Power

FOR CLAMSHELL DIGGING

Power to grab a boulder and tear it loose. Weight to penetrate and bite out a full pay load. Watch 'em work—or ask any man who owns one. All sizes available. Wire or write for prices. Descriptive Bulletins on request.

In stock at New York, Hartford, Philadelphia, Harrisburg, Baltimore, Atlanta, Birmingham & Los Angeles
GEORGE HAISS MFG. CO., INC., 139th ST. & CANAL PLACE, NEW YORK—DISTRIBUTORS EVERYWHERE

Why fool around with "second-best"?
If you want to make speed profitably
GET DEPENDABLE EQUIPMENT



Automatic pressure lubrication—requires no attention.

34-ft. hose—2 3/4" vibrator head.

Adjustable frequency to 6800 R.P.M. — submerged in concrete.

Powerful gas engine—4.7 H.P.

Long-lived, ball-bearing, rotary, hydraulic pump.

... Buy the Fast

JACKSON Hydraulic Concrete Vibrator

Designed to "take it" for 3 shifts a day — every day.
 Used exclusively by many large defense contractors.

ELECTRIC TAMPER & EQUIPMENT CO.

DEPARTMENT E

LUDINGTON, MICHIGAN

propeller shaft bearings, wider and deeper cross-members, new engine features, Hi-Tork hydraulic brakes and quicker acting air brakes. Carrying capacities range from 10,000 to 18,000 lb., gross vehicle weights from 14,500 to 27,000 lb. and wheelbases from 134 to 197 in. Powered by five sizes of 6-cylinder, valve-in-head, replaceable engines ranging from 84 to 114 hp. Other features: (1) Steering effort said to be reduced 50 per cent; (2) streamlined body; (3) sealed-beam type head lamps; (4) heavier fenders; (5) cabs with three-point rubber-insulated mountings, preventing side movement and twist, high-test safety glass, new instrument panel, headlight beam indicator in instrument panel and felt base rubber floor mat; (6) fuel pumps on left side of engine as precaution against vapor lock; (7) mechanically sealed water pump; (8) larger diameter distributor; (9) universal heat range spark plugs.—**International Harvester Co., 180 N. Michigan Ave., Chicago, Ill.**

★ ★ ★

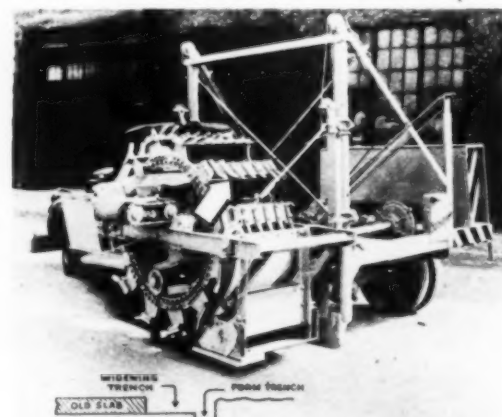
COMPACT PRINTING MACHINE, is 32 in. wide, 62 in. long and 48 in. high, operates with either cut sheets or roll stock and makes prints from ink tracings at 12 to 15 ft. per minute. Feature: New print and tracing return. Entire top of machine serves as return tray, tracing entering tray on top of print. No reversing of tracing necessary when



reinserting it into machine. Light source is 55-watt mercury quartz lamp which furnishes uniform exposure without flickering and is guaranteed for life of 1,000 hr., and which is installed on revolving 9-in. Pyrex contact cylinder said to provide almost perfect contact. Equipped with double centrifugal blower to reduce operating noise. Transmission and motor are resiliently mounted to reduce vibration. Automatic clutch, operated by wide-range foot pedal, releases feed roller when removal or adjustment of tracing is necessary. Made for two currents, 220-v. a.c., 60-cycle or 220-v., a.c., 50-cycle. Operating electrical requirements for entire machine 3,800 watts.—**Charles Bruning Co., Inc., 100 Reade St., New York City.**

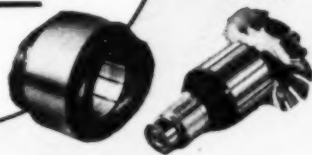
★ ★ ★

NEW ROAD WIDENER has digging wheel designed to excavate trench for forms simultaneously with excavation of subgrade widening trench. This is accomplished by equipping each bucket on digging wheel with two rooters which are somewhat larger and longer than other rooters on buckets. Built in three models: (1) For digging subgrade widening trench up to 33 in. wide in one cut; (2) for digging trench up to 48 in. wide in one cut; (3) equipped





*No
Electric Saw
is Better Than
its Motor*



Above — powerful No. 95 B & D Saw helps builders boost profits by pre-cutting all rafters at one time.

At left — armature and field coil assembly of Black & Decker Universal Electric Saw motor. Precision standards, quality materials and skilled workmanship insure the reliability, long-life and reserve power of the motors in B & D Electric Saws.

—that's why BLACK & DECKER ELECTRIC SAWS

have Motors Engineered For Greater Performance!

BLACK & DECKER build their own motors. That's why B & D Saws have plenty of reserve power to cut through tough spots without slowing up or running a fever! Backed by the skill of 30 years experience in the development of dependable portable electric tools for industry, Black & Decker Saws will clip costs and lick schedules on your own jobs. Four models with

depths of cut from $1\frac{3}{8}$ " to $\frac{1}{8}$ ". Quickly adjusted for angle and depth of cut — kept *safe* by instant acting, telescoping blade guards. Plug in any light socket or portable generator. Phone your jobber to show you the Four speedy Black & Decker Electric Saw models today — or wire The Black & Decker Mfg. Co., 759 Pennsylvania Avenue, Towson, Md.



Using Black & Decker No. 85 Quick-Saw and portable generator right on the job, contractors beat schedules by pre-cutting all studs and other framing members on a National Defense project.

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"SAW HANDBOOK"

Brand new! The most complete and profusely illustrated "Saw Handbook" published. Contains 28 pages of facts and pictures on dozens of Electric Saw applications, together with data on construction features of B & D Saws and Accessories. Get this book today!



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PORTABLE ELECTRIC TOOLS



2 HOURS from THIS to THIS!

SHOVEL work before noon, CRANE work after—both with the SAME MACHINE!

You can do it with a MICHIGAN—because it's quickly CONVERTIBLE—without adding lagging or an extra drum! With today's heavy demands on all construction equipment, this quick-change feature multiplies the value of every MICHIGAN mobile Shovel-Crane. It's a real time and money saver! No need to tie up several machines in scattered operations when the Convertible MICHIGAN is on the job for you. In double-quick time, this high-speed machine is WHERE you want it—WHEN you want it—and HOW you want it—as a Shovel, Crane, Clam, Dragline or Trench-Hoe . . . Send today for MICHIGAN Bulletin CM-16.

MICHIGAN POWER SHOVEL CO.
Michigan, U.S.A.
Benton Harbor



Learn how MICHIGAN Trench Hoes cut travel-time between jobs—Air Controls speed work—Modern Design and Construction reduce maintenance costs—how owners reap greater profits from trench-hoe jobs. Full data on the convertible MICHIGAN given in Bulletin T. Write for your copy today!

3/8YD
1/2YD



MICHIGAN
AIR-CONTROLLED

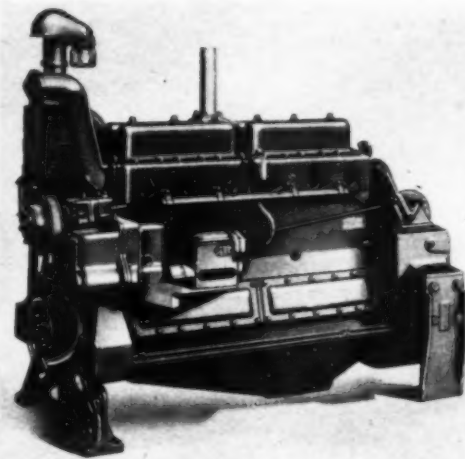
SHOVELS - CRANES - CLAMS

DRAGLINES - TRENCH HOES

with rear dump conveyor for carrying excavated material to trucks following machine (other models discharge on to shoulder). These machines are designed to prepare mile or more per day of accurate trench adjacent to old road surfaces; also for excavations on inner side of sharp curves where radius is to be increased.—Buckeye Traction Ditcher Co., Findlay, Ohio.

★ ★ ★

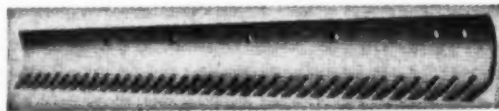
THREE NATURAL GAS ENGINES, designed for heavy-duty work with minimum of maintenance, are built in two cylinder sizes. One 6-cylinder and one 4-cylinder model have 4 $\frac{3}{4}$ x5 $\frac{1}{2}$ -in. bore and stroke and develop 74 and 48 hp. at 1,600 r.p.m. Small 4-cylinder unit with 3 $\frac{3}{4}$ x5-in. bore and stroke develops 34 hp. at 1,650 r.p.m. Heat resistant alloy valve inserts on all models. Engines have super-finished crankshafts with "Hi-Electro" hardened



journals. Main bearing surface on 6- and large 4-cylinder models are 118 and 89.5 sq.in. respectively; on small 4-cylinder model, 80.3 sq.in. Lubricating system said to provide efficient filtering and full pressure lubrication to all working engine parts. In addition, upper-cylinder lubricator is provided to supply extra valve lubrication for use with dry natural gas fuel. Combination gas-gasoline carburetor is standard equipment. Fuel system includes filter to clean gas with regulator to handle gas pressures as high as 150 lb. at supply. Complete manually operated manifold heat control is incorporated. All three models are available fan to fly-wheel or as complete power unit package with inclosed clutch and radiator.—Caterpillar Tractor Co., Peoria, Ill.

★ ★ ★

SAW TOOTH BLADE may be installed in place of regular blade on any type of maintenance or snow removal equipment and used to remove hard packed ice and snow. Because of its "pickaxe" action, according to its manufacturers, this blade cuts through where conventional type of blade is apt



to stall, breaks up irregularities and ruts and roughs up roadway sufficiently to reduce skidding hazard to great extent. Second trip over road breaks up frozen material to such an extent that it thaws more readily. On gravel and earth roads and on shoulders of concrete and brick and where concrete and black top roads have been heavily sanded, blade is said to dig up certain amount of sand and gravel, thereby eliminating need for further sanding. Claimed to be useful for other road maintenance work, cutting easily through hard, rutted surfaces.—Shunk Mfg. Co., Bucyrus, Ohio

★ ★ ★

AIR-COOLED TRANSFORMER, said to provide higher factor of operating safety than that realized in other models, has 60-cycle ratings ranging from 150 to 500 kva. inclusive for single phase and 150 to 1,000 kva. inclusive for 3 phase, voltages 13,200 v. and below. Makers claim that because no fire and

SAVES YOU



AND



BECAUSE...

MONARCH PRE-FORMED is made from 2 kinds of wire!



INNER WIRES ARE EXTREMELY FLEXIBLE. They're drawn in a special way to make them extra strong, extra pliable. They're improved plow steel too. These wires are the reserve strength of Monarch Whyte Strand rope. They bend easily over your sheaves and drums.

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These wires are improved plow steel, specially drawn for outside service. They are the rope's "first line of defense." That's why we give them a TOUGH abrasion resisting skin... a good reason why Monarch Whyte Strand ropes stand up so well on shovels, draglines, scrapers, and other equipment.

You get this EXTRA, TOO!

Around every wire in a Monarch Whyte Strand rope is a special lubricant which protects unseen, inside surfaces against corrosion and friction.

Why not let us give you the benefit of our experience on hundreds of wire rope installations like yours? There's no obligation of course. Write us, or call in your Macwhyte distributor for a rope recommendation.



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The correct ropes for your equipment

PRE-FORMED FOR BEST PERFORMANCE



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left-&-right lay braided slings*

*Stainless Steel wire rope — Aircraft Cables,
Aircraft tie rods and 'Safe-Lock' Swaged Terminals*

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WILLIAMS Buckets
built by **WELLMAN**

FOR BIG JOBS . . .
FOR SMALL JOBS

SCHRAMM DIESEL
ENGINE DRIVE

SCHRAMM GASOLINE
ENGINE DRIVE



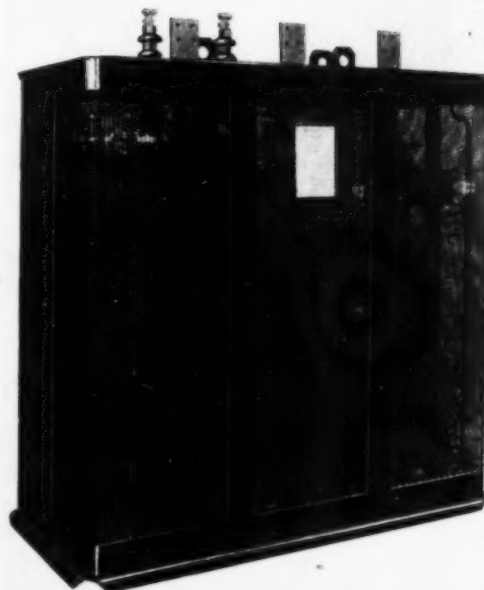
Model 105 Gasoline Engine Driven Portable Air Compressor on Two-Wheel Pneumatic Tire Spring Trailer With Tool Boxes.

SIZES 20 TO 420 ACTUAL AIR DELIVERED

WRITE FOR BULLETIN 4100

SCHRAMM, Inc.

WEST CHESTER, PENNA.



explosion hazards are possible, savings are obtained by elimination of protective vaults. Improved regulation and increased output are assured because these transformers may be located near load center, thus permitting secondary cable runs. Housing of expanded metal finished in black baked-on, moisture-proof enamel, permits free and easy flow of air from all sides and insures safety against accidental contact with live terminals. Primary and secondary cores separated by liberal air spaces through which stream of air constantly circulates. Windings designed for 75 deg. C. temperature rise under continuous full load operation. Heat resisting insulation, including porcelain, asbestos, mica, glass and air (in organic materials) are used throughout, allowing operation at higher temperatures than are permissible with liquid filled transformers. Weights and dimensions of air-cooled transformers said to compare favorably with similar ratings of liquid filled designs.—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

★ ★ ★

TROUGHING TYPE, RUBBER-TREAD IMPACT IDLER for belt conveyors is designed to absorb shock of receiving heavy, lumpy, rough materials at loading point. Cushioning effect of rubber-to-rubber contact between belt and idler said to prevent cutting, bruising and scuffing of belt and to protect bearings and framework from shock, thus prolonging life



both of belt and idler. Other features claimed: (1) Less breakage of fragile material such as coke and friable coal; (2) cleans belt and prevents building up of material; (3) withstands corrosion and abrasion. Molded rubber-tread 6-in.-diameter rolls said to cushion even heaviest blows, are firmly secured to Friction Fighter roller-bearing-equipped tube by set screws through malleable iron spacers which clamp over reinforced rubber hubs. New idlers available for belt widths of 14 to 60 in. Larger diameter rolls also may be supplied, as well as rubber tread impact rolls for flat-belt conveyor idlers.—Link-Belt Co., 307 N. Michigan Ave., Chicago, Ill.

★ ★ ★

HIGH-SPEED MOBILE CRANE, called Tournacrine and said to combine speed, lifting power and maneuverability, may be had in boom lengths of 20, 30 and 40 ft. and with lifting capacity of 10 tons. It is especially useful for unloading flat cars, erecting steel, stacking material in warehouses, placing concrete reinforcement on paving jobs and



*Baker Bulldozer on Harris County,
Texas, flood control project.*



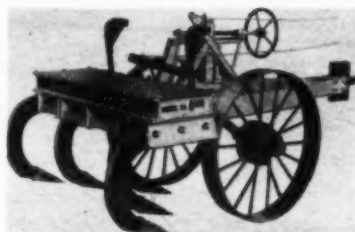
HYDRAULIC SCRAPERS

Three easy loading
models—3, 4 and
6 cu. yd. capacities
for any tractor.



ROTARY SCRAPERS

Automatic, Full re-
volving—in 5, 6
and 7 foot sizes for
any tractor.



ROAD ROOTERS

5 tooth, with 5 ft.
cut. Built in two
models for tractors
up to 50 H.P.

Much more is expected of road and earth moving equipment today than ever before. It has to be good . . . and fast! Baker Bulldozers and Grade-builders are measuring up to their jobs because they have everything it takes to keep things moving—smooth hydraulic control, tremendous down pressure and the necessary stamina to handle the toughest assignments. Baker Hydraulic Scrapers, Automatic Rotary Scrapers and powerful Road Rooters have long been recognized as leaders in the highway maintenance equipment field. Let them help you solve your problems efficiently and economically.

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**BULLDOZERS, GRADEBUILDERS
ROAD ROOTERS, SCRAPERS
ROAD DISCS, MAINTAINERS
SNOW MOVING EQUIPMENT**



For Better Fragmentation



It's cheaper to break up the stone in the original blast than it is to mud cap later on. Users of Primacord claim better fragmentation because: (1) Primacord, by acting as the detonating agent for each cartridge in the hole, gets more work out of the explosives. (2) While the detonating wave travels at a speed of nearly four miles per second, it is possible to plan the firing of successive holes and rows of holes to permit relief of burden. Send for the Primacord Book.

PRIMACORD BICKFORD Detonating Fuse

The ENSIGN-BICKFORD CO.
SIMSBURY, CONN.

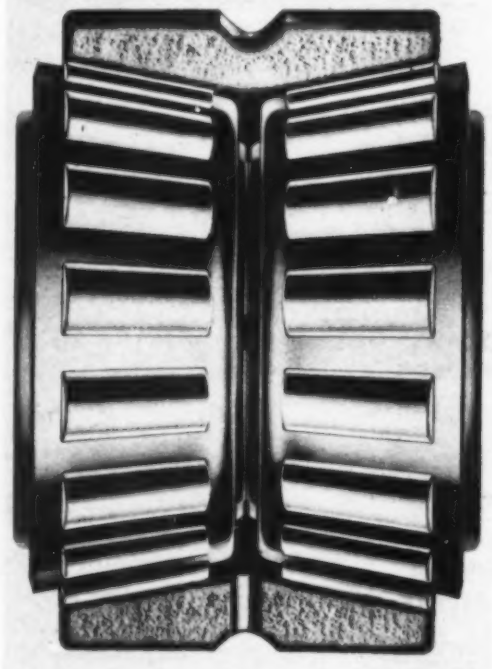
Makers of Cordeau-Bickford Detonating Fuse—and Safety Fuse since 1836



for handling large, awkward and heavy loads. Travels at speeds up to 14 m.p.h. Advantages: (1) Shortens time between widely separated jobs and extends work range of crane; (2) rubber tires and narrow width make possible fast movement over highways and concrete surfaces; (3) two-wheel maneuverability enables crane to work in extremely close quarters and over rough terrain. Main feature: Quick, easy interchangeability with other Tournapull tools, such as Carryall scrapers and Tournatrailers. Only one power investment said to be necessary to handle lifting, hauling and earthmoving jobs.—R. G. Le Tourneau Inc., Peoria, Ill.

★ ★ ★

TWO ROW, DOUBLE CUP, SLOTTED TAPERED ROLLER BEARING, especially adapted to serve as sheave bearing, has races and rolls ground to established precision limits so that when cones are assembled into cup, their front faces contact and proper running clearance is assured. Front cone faces are slotted and chamfered, as shown, to provide an entrance for lubricant into bearings. This feature said to be particularly advantageous in multiple sheave blocks where it is required that bearings be lubricated through pin which is sta-



tionary. Chamfered front faces eliminate necessity of machining deep annular groove around shaft to carry lubricant to various points of entrance in bearing. In some sheave blocks lubricant may be introduced through fitting in sheave hub, an annular groove and holes being provided for this purpose in cup. Problem of sealing bearing chamber simplified by extending length of large cone crib and creating surface concentric with shaft and sheave bore on which seal may be run. Bearings designed to minimum width and with an inner diameter large in relation to its outer diameter and also with maximum radial and thrust capacity for space occupied. Being an anti-friction thrust bearing as well as an anti-friction radial bearing, sheaves may rotate freely without axial float. Wear between sheaves and side plates positively eliminated. Tapered races of two rows of rolls directed one towards other said to result in extremely rigid bearing, preventing wobbling of sheave.—Timken Roller Bearing Co., Canton, Ohio.

ARMSTRONG Reversible Construction RATCHET WRENCHES



Among big ratchet wrenches for bridge, structural and erecting work the ARMSTRONG Ratchet stands alone with its drop forged, heat treated steel handle, its instantly reversible ratchet and hollow center sockets, that are machined from solid steel. Here are the strongest, longest wearing ratchets made — there is not a casting used, and all moving parts are hardened. They are cadmium plated.

Open spindle and socket permit long bolts to pass thru wrench so nuts can be run any distance on thread, and can be quickly and securely set.

24" Ratchet takes 1" to 2 3/16" Sockets (13 sizes)

36" Ratchet takes 1 1/2" to 3 1/8" Sockets (11 sizes)

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"The Tool Holder People"
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Eastern Warehouse and Sales Office:
199 Lafayette St., New York

ASBESTOS BRAKE LINING CLUTCH FACINGS AND FRICTIONS

that
HIT SPOT
the



For 27 years GATKE has sought tough jobs and developed materials to master them.

That's why GATKE Swing Frictions, Brake Lining and Clutch Facings dominate where the going is tough.



Whatever your service, just tell us what you need.

ASBESTOS PRODUCTS
FRICTIONS - BRAKE LININGS
CLUTCH FACINGS - FABRIC BEARINGS
GATKE CORPORATION, 226 N. La Salle St., Chicago

NEW TIRE, called speedliner, designed to conserve rubber supplies by producing more mileage per pound of rubber, is said to produce extra mileage because of an important change of construction that

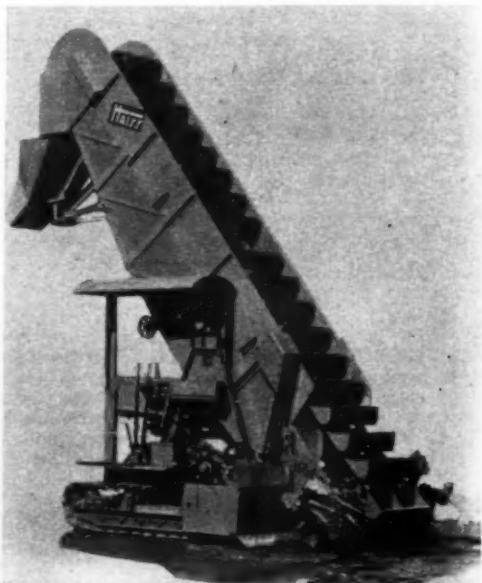


makes possible use of thicker, wider and flatter tire for contact with road. In new tire "breaker" strips, cushioning rubber and cord units that normally "float" on top of carcass just underneath tread to resist road shock and bruising, are placed between plies with cords in each breaker running parallel with those in ply above to lessen friction and heat. This strengthened thread foundation, permits use of extra-heavy tread without danger of overheating. Further strengthening is as-

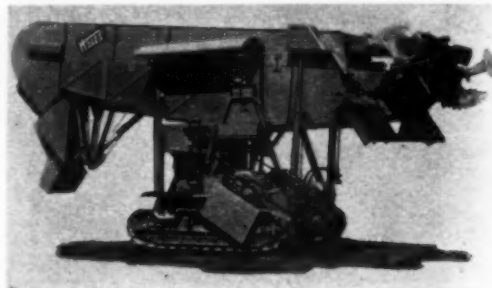
sured by addition of special ply of heat-resisting Tyton rubber that completely surrounds carcass, including breakers, to form perfect bond with tread. Available in complete range of sizes for buses and trucks.—The B. F. Goodrich Co., Akron, Ohio.

★ ★ ★

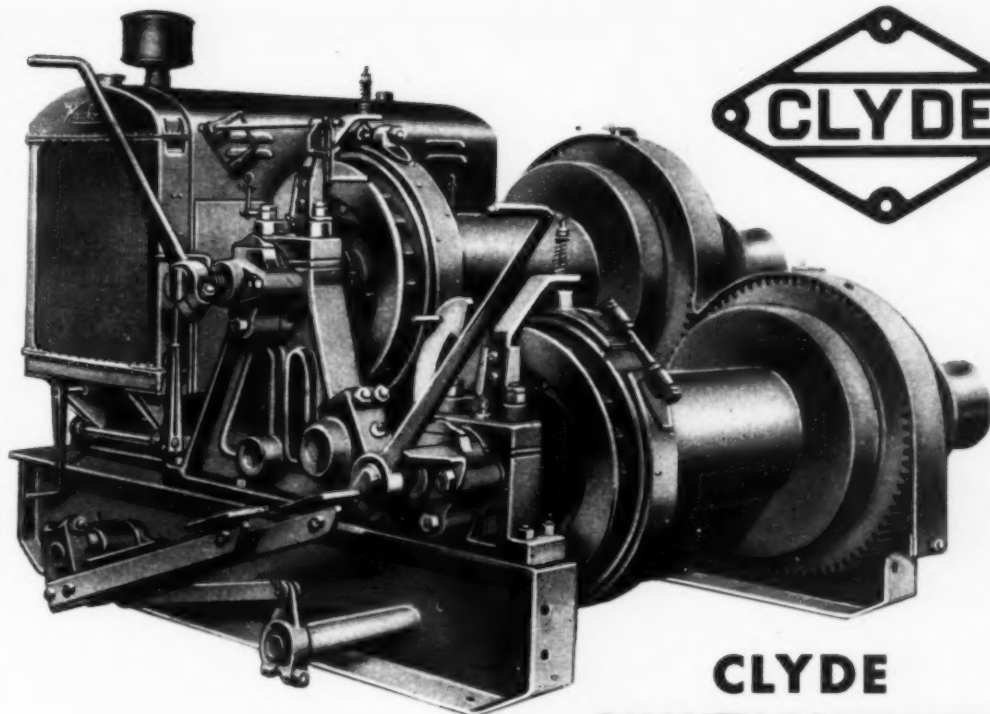
HIGH-DISCHARGE LOADER substitutes hydraulic lift mechanism for usual hand wheel operated device for raising and lowering digging end of elevator, thus solving problem of elevating discharge chute to load over high sides of 20-cu.yd. truck body, operation which requires chute clearance of



13½ ft. with 45-deg. chute angle setting and 7-ft. reach from bumper. Two hydraulic cylinders or jacks are used, one mounted on either side of elevator which has been structurally stiffened to prevent twisting strains on shaft of revolving paddle feeding device from being transmitted to hydraulic cylinders. Cylinders are actuated by oil pressure, power being supplied by oil pump attached to



engine of loader. Two-way valve located at operator's platform controls mechanism. Spring return to neutral affords safety factor. Loader illustrated has 36-in.-wide buckets and rated capacity of 5 to 8 cu.yd. per minute. It is fitted with broad-blade, serrated-edge feeding propellers for digging, pulverizing and loading top soil. Machine also is used for loading construction materials, gravel, sand, crushed rock and cinders. Weight, 28,000 lb. Powered by 65-hp. Waukesha engine.—George Haiss Mfg. Co., 140th St., & Rider Ave., New York City.



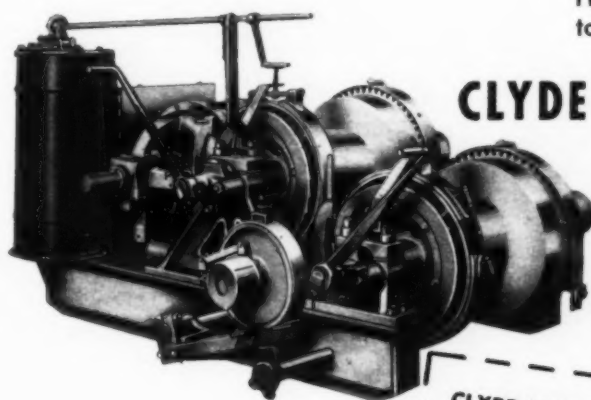
CLYDE QUALITY EQUIPMENT

Clyde hoists are scientifically engineered to provide the utmost in efficiency, safety and economy of operation. Every piece that goes into these machines is carefully designed for its particular load and purpose . . . strength is obtained without useless, dead weight . . . economy without sacrificing performance.

Check these Clyde features . . . compare the values.

All steel, electric welded, one-piece beds, extremely rigid. Double cone frictions, smooth, positive and easy acting. One piece drums with barrel, flanges, friction and brake surfaces machined for more efficient operation. Operating levers grouped for convenient manipulation. Semi-steel side stands with wide bearing surfaces. Gears with machine cut teeth, keyed and pressed on shafts. High-grade shafting turned and ground to exact size.

Gasoline Hoist Sizes		
Single Line Pull, Pounds	Hoisting Duty Variable Governed Speed, Feet Per Min.	Motor Horsepower
1,500	110-125	8
1,500	160-195	12
2,000	185-230	18
2,500	150-185	18
3,000	150-185	22
3,300	135-170	22
3,300	180-225	25
3,600	200-250	37
4,000	180-220	37
4,500	160-195	37
5,000	145-175	55
5,000	200-250	55
6,000	160-200	75
6,500	200-250	75
7,500	180-220	85
7,500	200-250	85
9,000	160-200	100
9,000	200-250	100
10,000	180-225	100
11,000	160-200	120
12,000	180-220	120
14,000	150-190	120



CLYDE IRON WORKS, Inc. Duluth, Minn.

Manufacturers of
HOISTS - DERRICKS - CARPULLERS
WHIRLEYS - HANDPOWERS
BUILDERS TOWERS and
DREDGE ENGINES

Special bulletins are available on any line of Clyde equipment.

CLYDE IRON WORKS, Inc.
Duluth, Minnesota

Please send Bulletin K34 giving complete specifications on Clyde gasoline and electric hoists.

Name

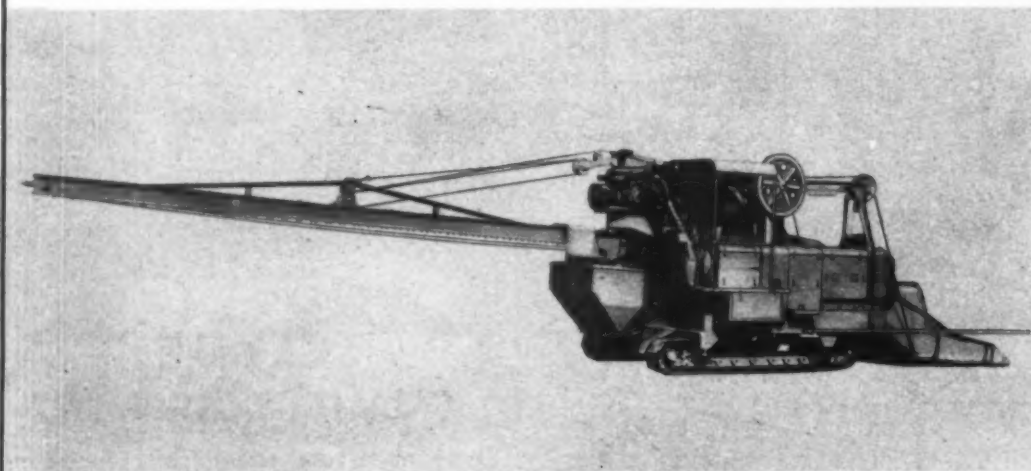
Address

City State

YOU'LL TAKE PRIDE IN YOUR CLYDE

Ransome

34^E "Single Drum" Pavers



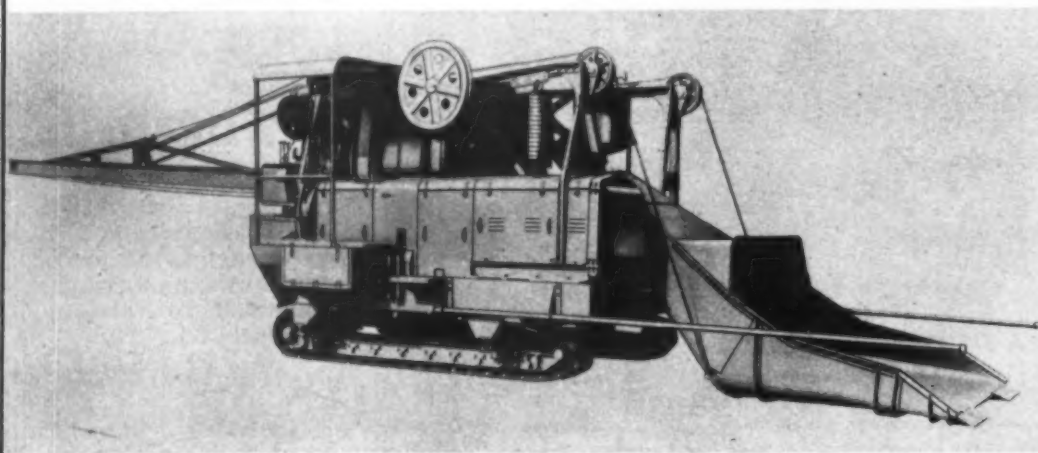
ONE YEAR in the field

The first Ransome 34-E "Single Drum" Paver was shipped early in June 1940. After a year in the field, owners report complete satisfaction with the flexible reliable performance of these machines. One user (incidentally, owner of two such machines) has this to say:

* "During December and January we have placed 94,628 square yards of Reinforced Concrete Pavement with this machine. This has been done under unusual and adverse weather and subgrade conditions. A large part of this pavement was placed over hydraulic fill which was very hard to stabilize. This machine is fast and very efficient."

Ask any owner — he'll tell you.

* Letter on file



Write for



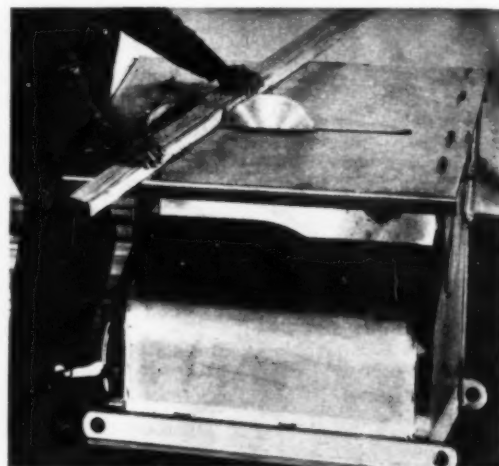
Literature

RANSOME

CONCRETE MACHINERY COMPANY
DUNELLEN NEW JERSEY

The Only Hydraulically Controlled Paver

STREAMLINED SPEED SAW named "Kost Kutter Sr." and said to be able to do work of much larger and heavier saws, has foot pedal that pulls "balanced" swing arbor through for cut-off work. Arbor can be locked in any desired position for ripping. Single wing nut clamps tilting table at both ends to hold in position. All-steel welded frame construction. Power unit protected against sawdust. Table tilts to full 45 deg. Powered by 6-hp. Timken bearing air-cooled gasoline engine with high tension mag-



neto, impulse coupling, and oil bath air cleaner, or 3- or 5-hp. 1,800 r.p.m. electric motor. Drive is through four matched V-belts with machined pulleys. Arbor, Timken bearing equipped, 1 1/8 in. diameter at saw end. Speed 2,700 r.p.m. Table 32x48 in.; height 37 in. Alemite hydraulic lubrication; standard equipment 14-in. crosscut and 14-in. rip blade and gages; minimum depth of cut, 4 1/2 in. Weight with gasoline engine, 725 lb.; with electric motor, 700 lb.; without power, 550 lb. Kost Kutter Jr., with 10-in. combination crosscut and rip blade, is said to be ideal for housebuilders to cut framing, form lumber or interior finish. Has 20x27-in. tilting table and tubular rip fence guide bars. Powered by 3.6-hp. air-cooled engine. Cuts stock 3 1/4 in. thick. Rips to center of 50-in. panel. Weight with gasoline engine, 375 lb.; with electric motor, 365 lb.—**Construction Machinery Co., Waterloo, Iowa.**

★ ★ ★

INCANDESCENT SEARCHLIGHT, 18-in., 1,000/1,500 watt, is particularly adapted for use in protective lighting systems now being installed by industrial concerns to prevent night sabotage. Other applications are railroad yards, construction projects, dams, locks, canals and prisons. Equipped for pilot-house



or hand control and comes with either high or low pedestal. With pilot-house control, searchlight can be mounted atop guard house or lookout tower and controlled from within house with aid of hand lever connected by steel rod to light above. Silvered glass parabolic reflector provides accurate control of light beam. Spherical auxiliary reflector in front of lamp eliminates stray light and builds up beam intensity. Searchlight casing made of sheet aluminum. Door glass clamped over face of searchlight makes unit weatherproof.—**General Electric Co., Schenectady, N. Y.**

COMPARISONS ARE OBVIOUS!



Tensile load capacities in above illustration on basis of 60,000 lbs. per sq. in. plates.

ALTER EGO: Literally, "one's other self"—the still, small voice that questions, inspires, and corrects our conscious action.

ALTER EGO: All I'm saying is: Look what some of the other boys have found. Both are accepted designs for about the same job. Look at the smaller welded section.

But arc welding isn't important enough yet to tread on our toes in this class of work.

ALTER EGO: Neither did highway transportation tread on the toes of rail transportation until all of a sudden—OUCH!! The railroads found their valuable payloads going by truck.

That's right, men are prone to ignore other men's experience until it's too late to use it. We haven't gone into the welding of structural members for some time.

ALTER EGO: Fact is, we never did GO in. We just looked in, because we haven't yet been confronted with the OUCH situation. But just read how the Army, the Navy, the shipbuilders, the Defense production divisions are right now hitting the trail—hard—to arc welding. Let's not wait until OUCH means "Out y'go!"

● ●
LINCOLN SUGGESTS: It's easy to GO into welded construction because you can start gradually—one simple design at a time. Thousands are doing this NOW—without interrupting normal rush work—are getting ahead with the greater strength, stiffness and economy of welded steel. "The Procedure Handbook of Arc Welding Design and Practice" (\$1.50 postpaid) will guide you. In fact, it points a way that's guaranteed to bring you profitable results.

Copyright 1941, The Lincoln Electric Co.

LINCOLN "SHIELD-ARC" WELDING

THE LINCOLN ELECTRIC COMPANY
Cleveland, Ohio

Authoritative Information on Design • Production • Welding Equipment

THE CART THAT CAN TAKE IT



No. 6 CART

STERLING
WHEELBARROW CO.
7100 W. WALKER ST.
MILWAUKEE, WIS.

FOR HEAVY DUTY

12 gauge tray all welded.
1/2" dia. continuous butt-welded rod at top of tray.

Malleable brackets extending full depth of tray.

42" diameter wheels—flat or oval tire.

Plain or roller bearings.

Can be equipped with 44" diameter pneumatic tire wheels.

Other carts having 30" or 36" diameter steel wheels, and 30" diameter pneumatic tire wheels.



HEAD BAND, called "Coolband," modern perspiration retainer for men on hot jobs, offers all-around-head absorption. Consists of soft, flexible band said to cling softly without binding and to create cooling effect on wearer. Coolband may be disinfected, as desired. Supplied in individual, air-sealed, transparent packages claimed to assure wearer fresh, clean, unhandled product. Also available in bulk. —**Mine Safety Appliances Co., Braddock, Thomas & Meade Sts., Pittsburgh, Pa.**

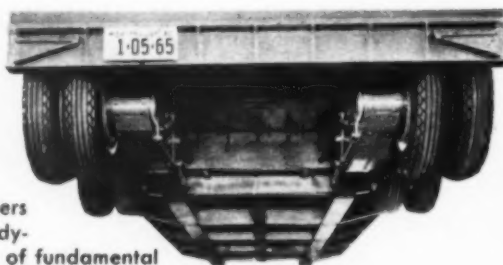
★ ★ ★

PORTABLE AIR COMPRESSOR, 60-cu.ft. capacity, is two-cylinder, single stage machine for mounting either on two pneumatic-tired wheels or on skids. Advantages claimed: Speed, easy portability and safety. Modern sheet steel housing. Hinged hood sides which close to cover tool boxes and may be locked. Standard equipment: Air receiver holding 7 cu.ft.; retractable caster wheel support; double-

A ROCKING BEAM Trailer?

**YES
HERE IT
IS!**

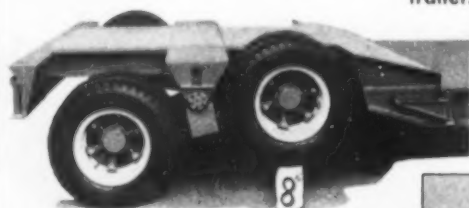
ROGERS also builds trailers for unusual needs, embodying characteristic features of fundamental design but modified to meet the special requirements. For example, consider the above illustrated



ROGERS TRAILER

This is the new Model T trailer which has two rocking, box-girder sections at each end of which is a spindle, carrying a wheel and two extra large tires. This design gives the desired oscillation and permits building trailers only 8 feet wide in capacities up to 35 tons. This two axle trailer meets the needs existing in some states that limit the tonnage that can be carried on one axle.

Write for information on standard or special trailers which have been tested in difficult service.



ROGERS BROS. CORP.
220 Orchard St., Albion, Pa.



EXPERIENCE
... builds 'em
PERFORMANCE
... sells 'em



acting towing eye; complete electric starting system; hinged hood sides; pneumatic tires; spring mounted chassis; 4-in. front and rear reflectors, and large oil, gas and water capacities. Internal features: Force-feed lubrication, circular plate type compressor valves; unit construction with one crankshaft serving both engine and compressor; valve-in-head engine; oil bath air cleaners; drop-forged connecting rods; steel-backed, babbitt-lined precision bearings; wet sleeve engine cylinders. Single crankshaft said to assure proper coordination between power strokes of engine and compression strokes of compressor and prevents misalignment between engine and compressor.—**Le Roi Co., 1706 S. 68th St., Milwaukee, Wis.**

★ ★ ★

LIGHT AND POWER PLANT, compact, lightweight, portable unit, generates 500 watts standard 110 v., 60 cycle, a.c., or 200 watts at 6 v., d.c., suitable for battery charging, if desired. Comes complete with Johnson 1-hp. "Iron Horse" single-cylinder, air-cooled, four-cycle engine 2 1/4 x 1 3/4 in. bore and stroke;

PREPAREDNESS *Means* SECURITY



LIMA shovels, draglines and cranes have taken new positions all along the preparedness front. In the Panama Canal Zone, Martin Wunderlich and Oke's Construction Company have dug in on the Third Locks job at Gatun. Before this vital job, so important to our National Defense, is completed, 12,000,000 yards of

dirt and rock will have been moved. No time was lost after the contractors received the work in purchasing three LIMA excavators; one a shovel with a 3½ yard dipper, one dragline with a 60' boom and 4½ yard bucket, and one dragline with a 90' boom and 4 yard bucket. These machines are on the job moving dirt at the rate of 3000 yards per eight hour shift per machine. Martin Wunderlich, long time user of LIMA

PANAMA CANAL PICTURES
excavating equipment, could not afford to take chances with excavators that he was not certain would measure up to requirements necessary on such an important job. He knew from past experience that LIMA equipment is built for hard continuous service and will produce the desired yardage at lowest cost.
Write for free bulletin!

ALL MACHINES WERE SOLD AS 3½ YARD SHOVELS, CONVERTIBLE TO DRAGLINES
LIMA LOCOMOTIVE WORKS, INCORPORATED
LIMA, OHIO
Shovel and Crane Division
NEWARK, N.J. NEW YORK, N.Y. DALLAS, TEXAS PORTLAND, ORE. SEATTLE, WASH.
SPOKANE, WASH. SAN FRANCISCO, CALIF. LOS ANGELES, CALIF.
PHILADELPHIA, PA. MEMPHIS, TENN. VANCOUVER, B.C.
MONTREAL, QUEBEC, CANADA

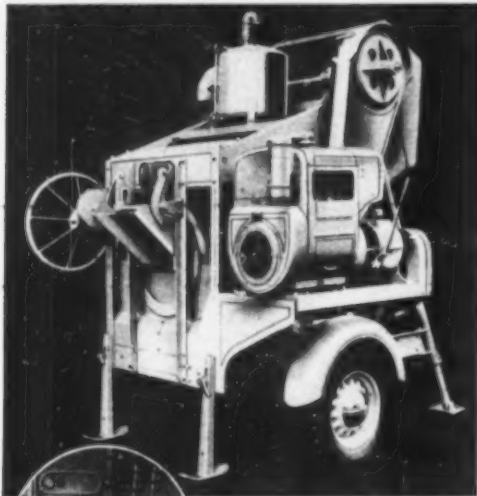
LIMA

SHOVELS, ¼ YD. to 3½ YDS. CRANES, 13 TONS to 60 TONS
DRAGLINES, VARIABLE

PANAMA
C.Z.

SPEEDLINE Mixers with MACHINED STEEL DRUM TRACKS and AUTOMOTIVE- TYPE TRANSMISSION . . .

GET THE PROFITS SLOWER MIXERS CAN'T PRODUCE



The Modern Transmission:
Runs in oil, enclosed from
dirt, weather. More effi-
cient, quieter, longest
lived, a real improvement.

Real Heavy Duty Service, in Mixers That are Light, Portable and Fast!

All the features that have made Jaeger the world's biggest selling mixers, plus latest improvements . . . faster trailing, easier handling, compact end-discharge design, fastest "Skip Shaker" Loading and "Pressure" Discharge, patented Criss-Cross "Re"-Mixing Drum . . . plus MACHINED STEEL DRUM TRACKS, ON CHILLED, ACCURATELY GROUND ROLLERS, AUTOMOTIVE-TYPE TRANSMISSION AND HIGHEST TYPE CONSTRUCTION NOT FOUND IN FLIMSY, "LIGHT-WEIGHT" MIXERS. Means more batches per day, more years of dependable service. Send for Catalog and prices.

THE JAEGER MACHINE CO.
800 Dublin Avenue, Columbus, Ohio



3 1/2 S End Dis-
charge, with
Measuring
Batch Hopper



5S to 14S — Alike
in All But Size



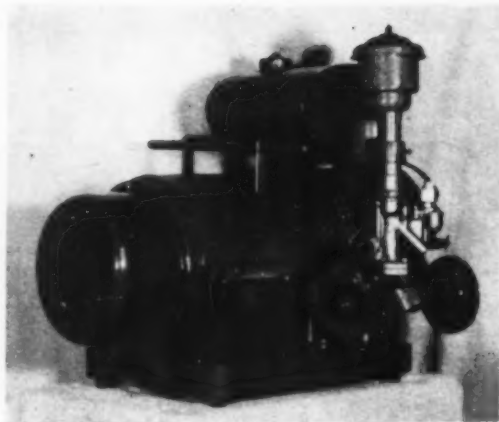
Tilters: 3 1/2 S



Loaders to
90" Width

2 or 4 Wheels

Built by JAEGER



a.c. generator; push-button starter; carrying handle; air cleaner; rope crank pulley; charge control resistor; d.c. ammeter; cutout; battery cables; filtered and shielded for radio operation. Length, 21 in.; width, 16 1/2 in.; height, 17 1/2 in.; net weight, 135 lb. Said to run approximately 9 hr. on 1 gal. of gasoline. May be equipped with remote control or automatic starting upon specification. Useful for sound trucks, trailers, cottages and other places where 500-watt capacity is sufficient. Other sizes available from 300 through 10,000-watt capacity.—Kato Engineering Co., Mankato, Minn.

★ ★ ★

THIN HEX NUTS for use on shear bolts where high degree of stress is lateral and for general application to light and medium stress fastenings are said to have approximately 40 per cent of strength of standard height hex nuts. They have been developed to meet demand for self-locking fastening



which is space, weight and cost saving. Self-locking action is accomplished by vulcanized fiber collar built into head of nut. This tough bone-like material resists entry of bolt, thus forcing nut outward and taking up all thread play. Fiber, being non-metallic and of resilient character, said not to deteriorate under vibration but continues to hold threads of nut and bolt in constant pressure contact. Nuts available in steel, brass and aluminum, in complete range of standard sizes, both coarse and fine thread.—Elastic Stop & Nut Corp., 2332 Vauxhall Rd., Union, N. J.

★ ★ ★

VIBRATION SERVICE LAMPS are designed particularly for industrial and commercial use where high frequency vibration set up by motors and machinery in constant use tends to weaken average bulb filament and shorten its life span considerably. Recommended also for use where early burn-outs are caused by vibration set up by rumbling trucks, as in store windows, and for use in hanging fixtures that might be subjected to accidental jolts, shocks and other rough usage. New bulb is as long as ordinary bulb, but has greater diameter to increase conductivity of heated argon and nitrogen gases inside bulb and to assure cooler lamp when burning. Filament is cushioned against shock and concussion of vibration by four molybdenum pigtail springs welded to six flexible filament supports. Stem unit has been shortened and made flexible. To increase lighting efficiency, nickel neck reflector disk welded to seventh support serves to deflect

Brace Yourself Against Cave-In Losses!



Cave-ins and slides are hazardous—retrenching and cleaning-out is costly—avoid them all with **Simplex Drop Forged Trench Braces**. Ball and socket joints at ends permit quick adjustment and tight gripping at off-angles. Available with blunt lever nuts or 3-way nuts for use with separate lever. Made in 14 sizes from 16' to 60' long in closed position. Ask your supply house.

Bulletin Industrial-41 covers trench braces, timber braces and other Simplex time-saving, cost-cutting jacks for contractors.

Templeton, Kenly & Co.
Chicago

Better, Safer Construction Jacks Since 1899

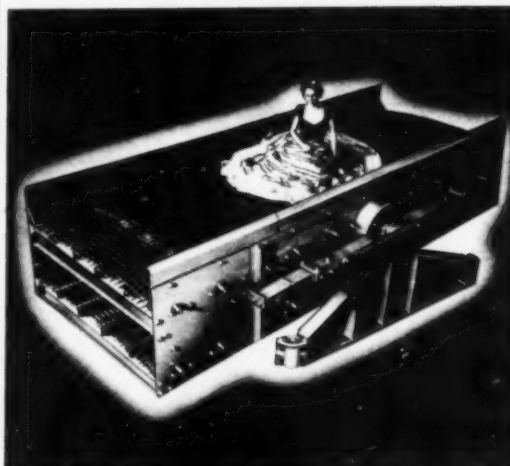
Simplex Jacks

dependable and efficient

Lever Type for toe and cap lifting.

Hydraulic for easier cap lifting.

Screw Jacks for economy.



Beauty and THE BRUTE!

The "beauty" of **ROBINS Vibrating Screens** is their clean, effective action under all conditions—their dependability in spite of grit, dust, wet, battering overloads.

This "brute" is a **ROBINS GYREX (72" x 192")**, the world's largest Vibrating Screen. It is only one model in the long line of **ROBINS Vibrating Screens** for every application.

Whether your screening requirement be standard or special, 200-mesh or 6" square openings, you get "beauty" of performance and "brute" strength by specifying "ROBINS".

Send for recent Bulletins on Robins Screens

ROBINS CONVEYING BELT COMPANY, PASSAIC, N. J.
BOSTON CHARLESTON (W.VA.) CHICAGO CLEVELAND
DETROIT NEW YORK PHILADELPHIA
PITTSBURGH SAN FRANCISCO



It Tamed a Raging River!



Engineers worked fast when rising waters broke through levees to flood 35,000 acres of rich farm land in the Sacramento River valley. Using ARMCO Sheeting they repaired the breaks, brought order out of chaos, and at the same time laid the groundwork to prevent a repetition of the disaster.

A closure structure was erected, using a timber and pile bulkhead faced with sturdy ARMCO Corrugated Sheeting. This afforded immediate relief and served as the core wall for a new permanent levee.

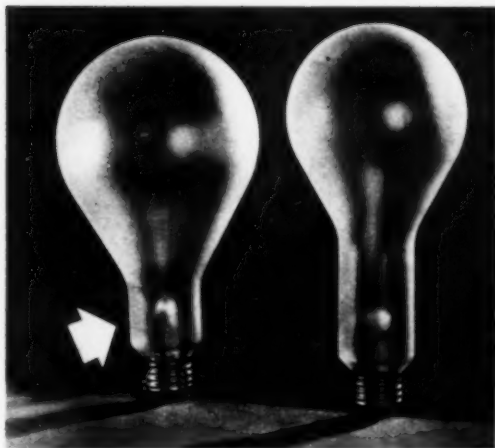
Emergencies like this one are unusual, yet there are many regular jobs that you can do exceedingly well with ARMCO Sheeting. Use it for trenches, cofferdams, foundations, bulkheads and similar projects. You'll find it low in cost, amply strong yet light in weight and easy to handle. It drives fast and can be used again and again.

ARMCO Corrugated Sheeting is available in three designs to meet various job requirements. Write for more information regarding its many practical advantages. ARMCO DRAINAGE PRODUCTS ASSOCIATION, 5062 Curtis Street, Middletown, Ohio.



ARMCO

SHEETING



light from neck of bulb. Center piece of mica insulates wire supports from disk and prevents base from heating. New lamp available in 100-, 150- and 200-watt sizes in five low voltages from 110 to 130 v. and in four high voltages from 220 to 250 v. Standard finish, either frosted or clear. Average burning life, 1,000 hr.—Wabash Appliance Corp., 335 Carroll St., Brooklyn, N. Y.

★ ★ ★

ALL-SURFACE OIL PAINT that can be applied directly to wallboard, calcimine, bare plaster, wall paper, brick, casein or any other porous surface is merchandised under name of "Uni-tex," and is said to offer savings in time, labor and material because one coat does entire job. Claimed to be easy to apply, to be without unpleasant odor and not to rub or flake off; to penetrate absorbent surfaces just enough to obtain tight bond, leaving paint film on surface. Preliminary sealing or priming, or washing off of calcimine not necessary. Colors specially lime-proofed so that Uni-tex may be used on freshly plastered walls. May be washed and refinished same as any other oil paint. Has high reflecting quality, yet reduces glare and eyestrain. —Elliott Paint & Varnish Co., 4523 West 5th St., Chicago, Ill.

★ ★ ★

CENTER-DRIVE SCREW GUN, known as "Scrugun," is said to be ideal for operation in suspended position. Its center spindle improves "aim," bonnet grip or paddle switch arrangement eliminates handles, and it will operate in reverse at full power when



equipped with reversing switch. Available with either positive or adjustable clutch and with either bonnet grip and toggle switch or paddle switch. It will drive wood screws up to No. 10x2-in., self-tapping screws up to No. 12 and machine screws and nuts up to 1/4-in.-diameter. No-load speed, 750 r.p.m.; optional speeds available, 500, 1,000 and 1,250 r.p.m. —The Van Dorn Electric Tool Co., Towson, Md.

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36th and Market St., Phila., Pa.
☐ Send complete information on "Roadbuilders" Water Hose.
☐ Send one of your men with samples.
Company
Name
Address

Date

Your Ticket to LOWER COSTS!

Here's What Would Happen if Your WATER HOSE FAILED!



MIXER WOULD STOP
SPREADER WOULD STOP
FINISHER WOULD STOP
TRUCKS WOULD BE TIED UP
MEN WOULD BE IDLE
Buy GOODALL "ROADBUILDERS" WATER HOSE
AND PREVENT ALL SUCH COSTLY DELAYS!

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Branches and Distributors from Coast to Coast



M-S-A

SKULLGARDS

PROVIDE TOP SAFETY AND COMFORT

It doesn't take a "big" job to require Skullgard head protection (although you'll find this favorite work hat on the country's largest projects). Wherever a head can be hurt, time lost and compensation paid through accidental injury, *there* Skullgard's tough strength, light weight, ventilated comfort and wear-proof durability are a vital necessity. Find out why Skullgards, made of laminated bakelite, are the widest-selling protective hats in America—write for Bulletin No. DK-6.

M.S.A. COMBINATION SKULLGARD-WELDING SHIELD

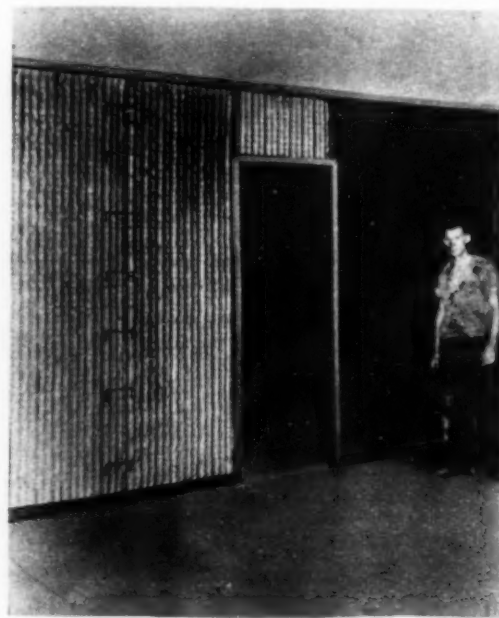
For welders exposed to overhead hazards, this practical combination provides the safety and wearing ease of a cap-type Skullgard with the protection of a modern welding shield. The detachable shield tilts upward when desired, and the Skullgard may be removed and worn separately for other work as required. Ask for Bulletin No. CE-9.

MINE SAFETY APPLIANCES COMPANY

BRADDOCK, THOMAS AND MEADE STREETS • PITTSBURGH, PA.

District Representatives in Principal Cities

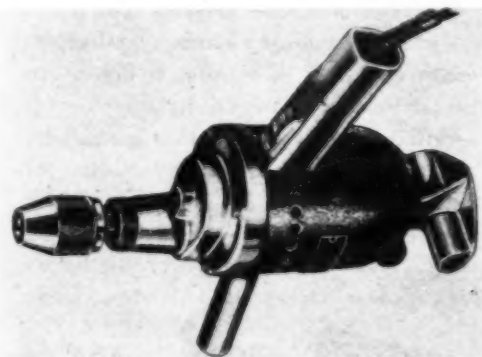
LIGHTWEIGHT BUILDING PARTITIONS, called Reyn-O-Wall, 2 in. thick, for use in construction of non-loading bearing walls are designed, fabricated and shipped knocked down as complete unit. Made of two layers of steel reinforcement securely attached to each other, leaving an air space or hollow core between layers. Core is reinforced on both sides with vertical galvanized steel V-shaped ribs. Outstanding advantage claimed: simplified erection. Prefabricated core sheets are self-supporting, requiring no studs and are erected in units extending in one piece from floor to ceiling. U-shaped anchor



clips of galvanized wire are supplied for fastening adjacent core sheets. Reyn-O-Wall is said to be lighter in weight than ordinary partitions, and hollow core provides high sound-deadening value, eliminating drum-type noises often heard when solid core partitions are used. Also claimed to be fire resistant and to save floor space, making it especially suitable for use in apartment and office buildings, post offices, schools and hospitals. Door frames, electric light outlets and conduits and pipe lines are set in place before erection of partitions. Metal box-type base and perforated ceiling runners, together with accessories, are supplied. Base is installed directly upon finished concrete or wood floors and runners are tied or nailed to ceiling. Core sheets then are set in slots in base, attached to vertical leg of ceiling runner and fastened in position with annealed steel tie wires. Partition then is ready for plastering.—Reynolds Metals Co., Inc., 155 East 44th Street, New York City.

★ ★ ★

1/4-IN. DRILL has new type natural grip breastplate handle which is said to make possible more direct application of power (applying thrust directly behind drill point) and thus increase accuracy and speed of drilling operations. Light enough for portable use, yet heavy enough to stand up to



production drilling. Powered by specially wound, high torque back-geared Universal Speedway drill motor. Self-aligning, oil-less bearings, forced air cooling. Low load speed said to make drill particularly adaptable for use with carbide drill bits in drilling brick, stone and concrete, as well as regular production drilling in steel, iron, wood and other materials.—Speedway Mfg. Co., 1859 S. 52nd Ave., Cicero, Ill.

1 UNUSUAL ORGANIZATION

2 EXCEPTIONAL FACILITIES

3 AGGRESSIVE RESEARCH

4 100 YEARS EXPERIENCE

THE ROEBLING "4" SPELL ROPE ECONOMY



Rope economy doesn't mean the economy of a single rope. It means economy over the long run—the economy of your ropes *as a whole*.

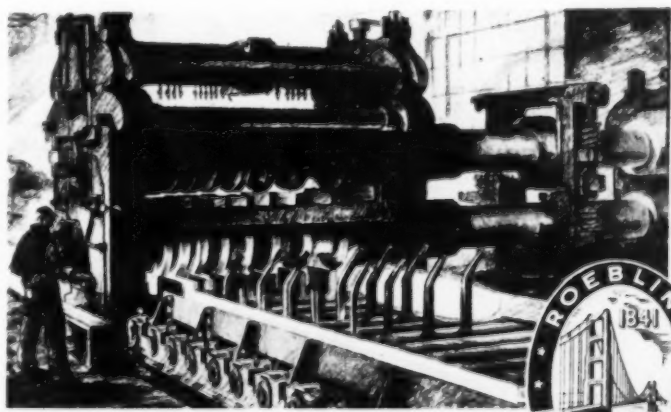
That is the kind of economy that the Roebling "4" assure in full measure. It's the economy of Roebling "Blue Center" Wire Rope—economy in terms of *overall* rope safety and minimum *general average* rope operating cost.

ROEBLING
"Blue Center"
STEEL
WIRE ROPE

"TAILOR-MADE" STEEL MAKES A BIG DIFFERENCE!

Roebling "Blue Center" quality starts right with the steel. We make our own—in special open hearth furnaces—because that's the only way we can guarantee the extra toughness and stamina that "Blue Center" steel must have.

100 years of experience. Painsstaking care. Control of every process from steel making to final testing. These are some of the important factors that count so heavily in Roebling rope service.



JOHN A. ROEBLING'S SONS COMPANY

TRENTON
NEW JERSEY

Branches in Principal Cities Export Division: 19 Rector St., New York, N.Y., U.S.A. Cable Address: "Roebling's", New York



FIRST LINE DEFENSE

on any wet job—a

100% MORETRENCH WELLPOINT SYSTEM

The photo shows you a typical Moretrench installation on a pumping station—normal water level top of ground—DRY DIGGING 20' below!

Turn your dewatering problems over to Moretrench for guaranteed results.

MORETRENCH CORPORATION

90 West St., New York

ROCKAWAY, N. J.

JOLIET, ILL.

NEW ORLEANS, LA.

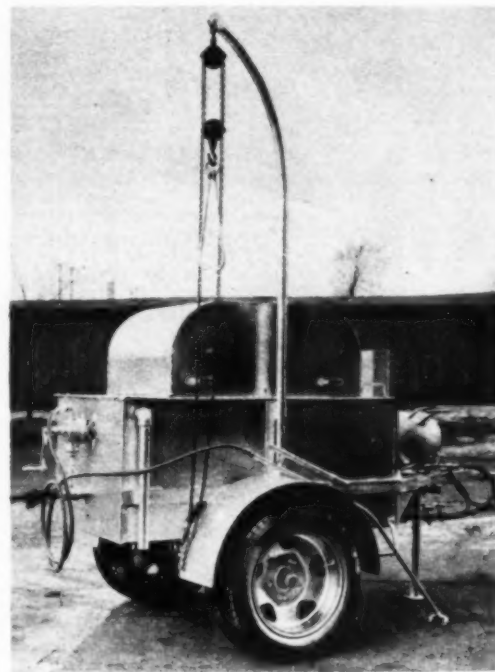
MOBILE PRESSURE LUBRICATION UNITS for either truck or trailer mounting are designed for servicing tractors, trucks and other heavy-duty construction equipment in field. Graco Convoy Luber model, illustrated herewith, consists of 3-hp. gas engine driving two-stage air compressor, 30-gal. storage tank, and three lubricant pumps which deliver lubri-



cant directly from original 100-lb. drums through service hose reels at rear. Each reel carries 50 ft. of hose fitted with service outlets. Five of these reels are supplied, two for chassis lubricant, one each for gear lubricant or motor oil and track lubricant and one for compressed air. Units are also made with rectangular built-in lubricant tanks and with 1,500-watt electric generator for illuminating night work or for charging batteries. Lubrication units are all 46 in. wide and vary in length from 78 to 95 in. For all-weather service an exhaust heater maintains lubricants at a viscosity conducive to rapid delivery. —Gray Co., Inc., Minneapolis, Minn.

★ ★ ★

PORTABLE KETTLES for heating asphalt, road oil and tar for repairing bituminous highways and for filling cracks or covering broken spots in concrete surfaces, has fireproof top which is designed to combat fire hazards in heating inflammable material. Instead of hinged hatchways, top is fully welded to kettle, with entrance through 16-in.-



diameter manhole with lid held by clamping device. Automatic overflow at rear of kettle permits exit of gases or foaming material as far away as possible from oil burners. Available in capacities of 65, 110, 165, 220 and 300 gal. All are equipped with oil burners, with double heat circulation and stack exhaust. Fenders have asbestos insulation to protect tires. Semi-elliptic springs and pneumatic tires for ease in towing. Spray pumps, either hand- or gasoline-engine-operated, are usually placed on rear of kettle for complete accessibility. Either flexible metal or rubber steam hose carries hot material to spray bar with insulated handle. Barrel hoist, thermometer, warming hood for an additional barrel and dual tires are available, if desired.—White Manufacturing Co., Elkhart, Ind.

★ ★ ★

SUPER POWER TRUCKS have become available in full-balanced line which includes units from 1½ tons upward in both conventional and cab-over-engine types. Advantages: (1) Operate with less fuel; (2) provide less truck weight for greater pay-

SLOWLY!

*don't do it until
you've asked your lawyer*

Going after a contract in some outside state? Should your company be qualified as a foreign corporation in that state before you make the first move on the job? Is it a state in which you should be qualified even before you submit a bid? Is it a state in which you should have your own designated agent for process even after you have pulled out of the state? Better ask your lawyer before you do a thing.

Don't forget that a corporation is a creature of law: What it may do or be is not, as with an individual, what it chooses, but what the law grants it the privilege of doing or being. If it is found to have done something somewhere that it was not chartered or qualified to do, then it's in a bad way. So a corporation should always have a lawyer near at hand and should consult him before embarking on any new course or adopting a new method.

And that is why a company, to enjoy the advantages of the Corporation Trust system—a system of cor-

porate protection for corporations doing business away from home—must first have a lawyer.

If you would know more about it, write for free pamphlet, "When A Corporation Leaves Home."

The Corporation Trust Company
C T Corporation System

and associated companies

120 Broadway, New York, N. Y.



EVERYBODY SAID
*it couldn't
 be done!*



THE ADAMS LINE INCLUDES

Motor Graders from 31 h.p. to 68½ h.p.
 Leaning Wheel Graders—6½ ft. to 12 ft. sizes.
 Hauling Scrapers in 3¼, 5¼, and 12½ yd. sizes.
 Elevating Graders in 42 in. and 48 in. sizes.
 Tamping Rollers with single or double drums.
 Road Maintainers for high-speed maintenance up to 15 m.p.h.
 Power Control Units for all makes of tractors.
 Terracers, Road Patrols, Rotary and Drag Scrapers, Rippers, Road Plows, Rooter Plows, Blades, etc.

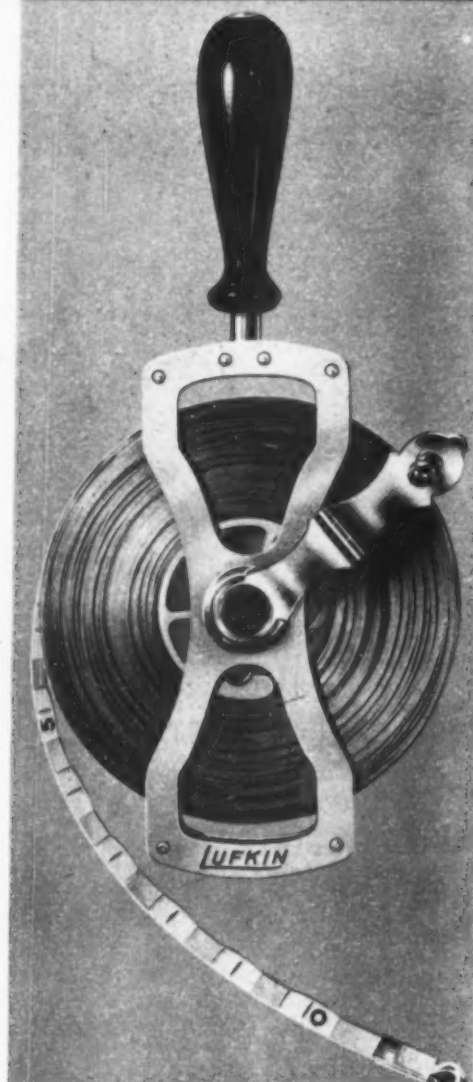
● Two 12½-yard Adams scrapers loading silt sand out of the San Gabriel river bed (Calif.) on a recent bridge approach job, done by J. E. Haddock, Ltd., Los Angeles . . . Lying under ocean tide-water, the material was so unstable that, in many places, a man could not walk safely — yet, the scrapers came out with full loads and without pusher help . . . “Everybody said it couldn’t be done, but we did it,” say the contractors.

While you may not encounter this type of work, you will appreciate the qualities which made Adams scrapers successful on this job and which will work profitably for you . . . Easy loading — High bowl clearance for hauling — Balanced weight distribution, that floats the load on four big, low-pressure tires — and Easy dumping action . . . Available in three sizes. Let us demonstrate a suitable size on your job. Write or ‘phone your local Adams representative today or write

J. D. ADAMS COMPANY, INDIANAPOLIS, INDIANA
Sales and Service Throughout the World

ADAMS *Hauling Scrapers*

"MICHIGAN" Babbitt Tapes



Because "Michigan" Babbitt Tapes are so rugged, they're especially popular for highway, railway and general work that demands rough use. The extra tough steel is white metal coated and markings are deeply stamped into long-wearing Babbitt Metal. See them at your dealers.

WRITE FOR CATALOG

LUFKIN

SAGINAW, MICHIGAN • New York City
TAPES • RULES • PRECISION TOOLS



load possibilities; (3) give more power with which to cut down road time; (4) lower maintenance costs. Trucks are powered by four basic Super Power 6-cylinder engines ranging from 90 to 125 hp. Gross vehicle weights, 14,000 to 32,000 lb. Choice of seven wheelbases running from 136 to 226 in. All types include straight trucks, tractor models and six wheel units. Mechanical features include six-port intake manifold, copper-lead, indium-treated main and connecting rod bearings. Stellite-faced exhaust valves and seats in all models with sodium-cooled valves added feature on two largest engines, Wilcox-Rich hydraulic valve lifters, by-pass thermostatic cooling system, aluminum pistons, five-speed transmissions and oil temperature control. Optional equipment: patented air heater to preheat carburetor air. Five-speed axles standard on large models, optional on smaller units.—The White Motor Co., Cleveland, Ohio.

★ ★ ★

Improved Cinder Spreader

AT A COST OF LESS THAN \$60 EACH, B. M. Chaplin, maintenance superintendent, Monongalia County, Morgantown, W. Va., for the West Virginia State Road Commission, built in the maintenance garage improved cinder spreaders developed from the original design shown in *Construction Methods*, April, 1939, p. 46. In the improved spreader, small industrial wheels replace the automobile wheels formerly used, lowering the unit sufficiently to permit direct dump-



WITH TRUCK BODY LOWERED, cinder spreader is raised clear of roadway surface. When in contact with roadway, small industrial wheels rotate spinner plate attached to vertical jack shaft.

ing from the pulling truck into the hopper of the spreader.

As in the original model, the new spreader utilizes a discarded automobile rear axle with a short jack shaft. A spinner plate is mounted on the universal flange; but, in order to lower this spinner plate to a posi-



How to
protect people and property
against air attack

This book gives a complete treatment of defense against air raids, showing the nature of destruction caused by them and what protection is possible, and describing the methods, equipment, and organization necessary to effect it. Based largely on experience in London and European cities, the book gives the most authoritative possible view of civil air defense for engineers, government officials, and householders.

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*A Treatise on the Protection of the
Civil Population against Air Attack*

By Augustin M. Prentiss

Lt. Col., General Staff Corps, U. S. Army

334 pages, 6 x 9, illustrated. \$2.75

HERE is a book of the utmost importance to every citizen, to those responsible for public security in all branches of government, to business men responsible for the safety of their employees and property, and to engineers and architects who must solve the many technical problems pertaining to shelters and other means of protection against attack.

The book describes the various means and methods of air attack and the effects produced by each; contains details of blast and fragmentation effect of bombs, placing and structure of shelters, gas-proofing requirements, British Code governing construction of shelters, and other specific data of value to construction men.

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| 3. Defense against Air Attack | 12. Demolition and Repair Service |
| 4. Protection against High Explosive Bombs | 13. Decontamination Service |
| 5. Protection against Incendiary Bombs | 14. Air Raid Precautions Command Organization |
| 6. Protection against Gas | 15. Training of Air Raid Precautions Personnel |
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*The Most
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of Shovels
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WHERE PERFORMANCE COUNTS THEY USE LINK-BELT SPEEDER EQUIPMENT

No matter what your requirements are for shovels-draglines-cranes—there is a machine in Link-Belt Speeder's line to suit your needs.

Every unit in this comprehensive line of $\frac{3}{8}$ to 3 yard shovels-draglines-cranes is a product of years of successful engineering, manufacturing and field expe-

rience. From the raw unformed steel to the finished product, Link-Belt Speeder machines are built step by step to conform to rigid, field-tested engineering and manufacturing standards. Thousands of satisfied users testify to the superior performance of Link-Belt Speeders.

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LINK-BELT SPEEDER CORPORATION

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and Now **ALL** **7** IN EACH CONTINENTAL ENGINE



RED SEAL POWER FOR INDUSTRIAL APPLICATION

The cornerstone of Continental's industrial importance has always been skill—skill in power research, skill in power engineering, and skill in power production. It is a fundamental skill—one that has the versatility to cope with the ever-changing power problems of each succeeding year.

In addition to this fundamental skill, Continental has advanced the skill of product design. Majestic, streamlined beauty enhances the appearance of Red Seal Power Units.

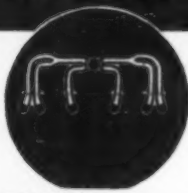
Discuss your power problems with capable Continental engineers. Make use of their knowledge, experience, and cooperative helpfulness.



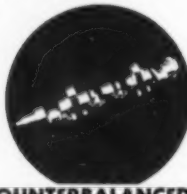
5 BALL BEARING WATER PUMPS
With carbon seal packing provide an adequate supply of water for Continental's directional cooling.



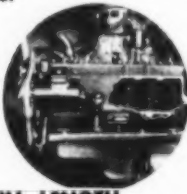
6 DIRECTIONAL COOLING OF VALVE PORTS
And scrubbing of valve seats places the coldest water where it is most needed and tempers it before reaching the cylinder bores, avoiding bore distortion.



1 INDIVIDUAL PORTING
Each cylinder has its individual intake passage, the intake manifold having separate passages which conduct fuel in equal portions to each intake port.



2 COUNTERBALANCED CRANKSHAFT
The addition of counterweights reduces bearing loads and friction and materially aids engine smoothness and life.



3 FULL LENGTH WATER JACKET
This allows greater crankshaft bearing area and results in uniform bore temperatures permitting close fit of pistons and low oil consumption.



4 CYLINDRICAL STRUT PISTONS
Provide maximum rigidity also uniform heat flow away from piston head and rings. Continental connecting rods are uniform with heavy I-beam section.



7 PRESSURE LUBRICATED TAPPETS
Are easily adjusted and retain adjustment. Pressure lubrication and greater bearing area reduce wear and insure quiet operation.

tion which permits dumping directly into a hopper above it, the designer welds the plate to the bottom of a piece of 4-in. pipe which extends down over the drive-shaft housing and is welded to the jack-shaft flange, machined to fit. The length of the 4-in. pipe sleeve varies according to different types of axles used.

A shield covering the spinner plate flares out at the rear to spray cinders over the roadway. The spinner rotates counter-clockwise, and the shield deflects cinders to the left, making it possible to spread uniformly over an 18- or 20-ft. roadway, with the truck moving on the right side of the center line. An adjustable tongue



SHOP-BUILT on old automobile rear axle, cinder spreader covers full width of roadway at rapid rate. Unit is low enough to permit dumping directly into hopper from tail-gate attachment on pulling truck.

is readily altered to permit attachment of the spreader to any truck.

Welded to the hopper plate at the left side of the cinder spreader is a piece of 8-in. pipe which forms a socket for an ordinary flare torch serving as a tail light, and at the same time, illuminating the work for the operator.

To feed cinders to the spreader, a tail gate attachment is easily and quickly mounted on the truck body by sliding it in from the rear. The flared sides of the tail-gate attachment are bolted to the truck body with 1/2-in. bolts, spot-welded to the side plates. A guard rail running across the rear end of the tail-gate attachment and extending up to the truck body protects the operator, who stands on the tail gate to shovel cinders through the chute into the hopper. Steel angles on both sides of the chute are bent to form hooks which slide under the tail gate and hold it at the proper angle.

CORRECTION JACKSONVILLE BRIDGE

HARRINGTON & CORTELYOU, Kansas City, Mo., made the design and detail drawings for the new Main St. bridge across the St. Johns River, Jacksonville, Fla., as consultants to the Florida State Road Department. The name of the consulting firm was erroneously reported as Ash, Howard, Needles & Tammen in Construction Methods, April, 1941, p. 67.



Continental Motors Corporation
MUSKEGON, MICHIGAN



Measure the **VALUE** of "Hercules" (Red Strand) Wire Rope by what it will do

RESULTS are what count — now more than ever. In order to speed up production, and still maintain a reasonable margin of profit, it is of utmost importance to use materials and equipment of proven dependability.

For 55 years "HERCULES" (Red Strand) Wire Rope has been demonstrating its stamina and trustworthiness. Its record of consistent performance—day after day, and month after month — has made and held a host of loyal friends. Such performance is never a matter of chance, but the result of sound fundamental principles, extensive research, experienced

organization, and efficient manufacturing facilities.

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Preformed-
"HERCULES"
RED STRAND
WIRE ROPE
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IT'S TOPS AS
A
MONEY SAVER

We especially recommend the Preformed type of "HERCULES" (Red Strand) Wire Rope for use on backfillers, bulldozers, carryall scrapers, clamshells, conveyors, cranes, draglines, dredges, hoists, mining machines, shovels, skimmers and trench hoes. We will gladly furnish full particulars.

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Tournapulls spread their own loads, add substantially to compaction, thus save you money on the fill. Here a Super C spreads 11 pay yards on a runway at Fort Crook.

For Moving BIG YARDAGES QUICKLY on LONG HAULS use TOURNAPULLS

Super C Tournapulls Average 2940 Cu. Yds.
Per Unit Each 21-Hour Day on 2400-Foot
Round Trip for Peter Kiewit Sons' Company

ACTUAL JOB DATA

To finish a 4,000,000 cu. yds. defense project at Fort Crook, (Neb.) on time, Peter Kiewit Sons' Company, pioneer Nebraska user of LeTourneau Carryalls, maintains a daily production of 50,000 cu. yds. About $\frac{1}{4}$ of this yardage is handled by four 150 H.P. Super C Tournapulls pulling LP Carryalls (15 heaped yards). Working in sandy clay on a 2400-foot round trip, with well maintained haul road, high average speeds enabled these Tournapulls to perform as follows:

*Loading.....	1.2 min.
Spreading.....	.4 min.
Turns, gear shifts, acceleration and waiting for pusher contact.....	1.2 min.
Travel time (both ways).....	1.9 min.
Total.....	4.7 min.
Trips per hour.....	12.75 (one unit)
Pay yards per load (Supt. estimate).....	11.0
Pay yards per hour.....	140.0
Pay yards 21-hour day..	2,940.0 (one unit)
Pay yards 21-hour day..	11,760.0 (fleet of four)

That's moving earth far and fast.

Try fast-moving Tournapulls on your job as so many other alert contractors are. See for yourself how Tournapulls extend Carryall savings to long hauls beyond tractor-scraper range. Talk to your LeTourneau-"Caterpillar" dealer . . . get your order in NOW.

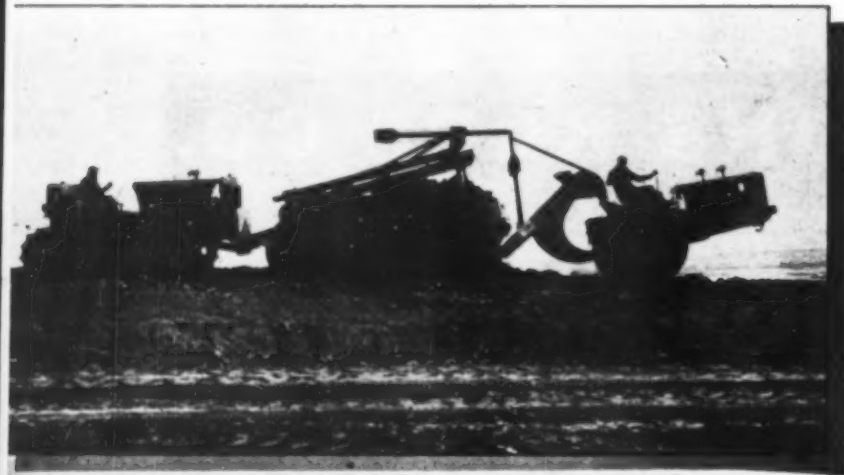
ACTUAL JOB DATA

gathered and compiled at Fort Crook by our Field Engineering Dept. You are invited to call on this department for aid in estimating and planning the best methods of handling your earth-moving problems.

SEE OPPOSITE
PAGE FOR
'DOZER DOPE'



Tournapulls are quickly and cheaply loaded with a pusher, have plenty of power and the proper gear ratios to give you the quick acceleration so necessary to high average speed.



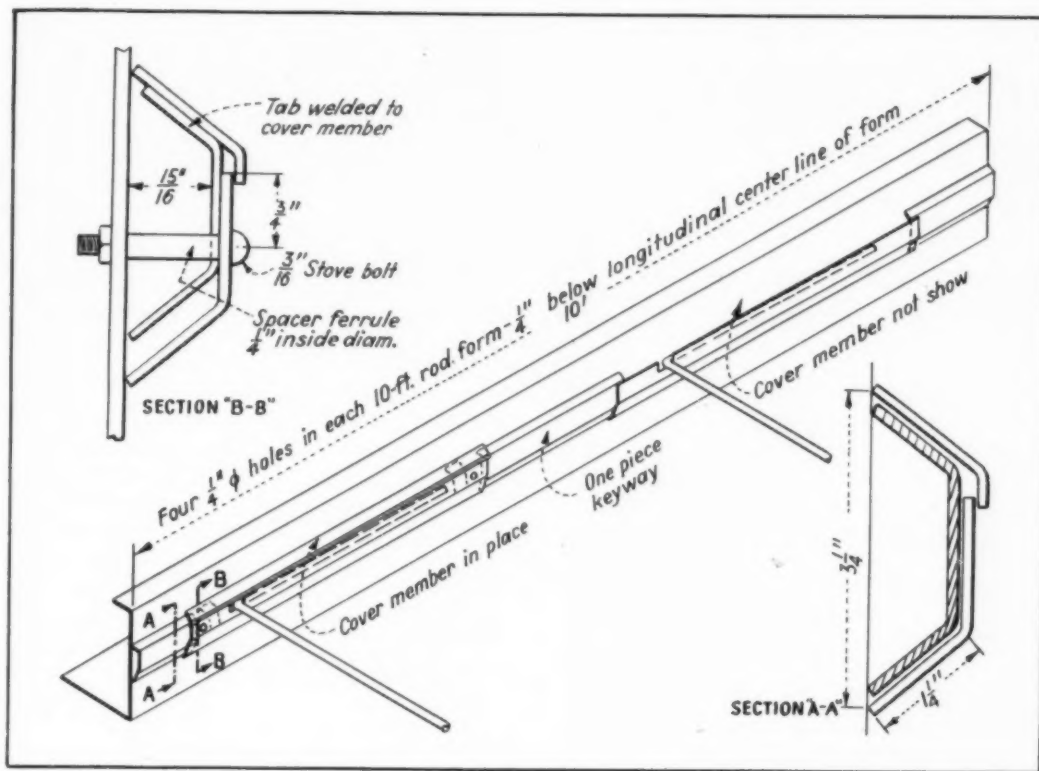
LETOURNEAU

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

For Lowest Net Cost per Yard-CARRYALL* SCRAPERS, ANGLEDZERS*, POWER CONTROL UNITS, BULLDOZERS, ROOTERS*, TRACTOR CRANES, PUSHDOZERS, TOURNAPULLS*, SHEEP'S FOOT ROLLERS, TOURNATRAILERS*, TOURNACRANE.

*Name Reg. U. S. Pat. Off.

Accessible Two-Piece Keyway Simplifies Tiebar Installation in Concrete Pavement



LONGITUDINAL KEYWAY made up of two members, a bottom member bolted to form and a top cover member installed after bent dowel bars have been placed, facilitates insertion of tiebars and permits stripping of keyway without bending of bars.

A TWO-PIECE LONGITUDINAL KEYWAY invented and patented by Clinton Bean, New Rochelle, N. Y., has served concrete paving contractors in a number of states during the last two years and is now being promoted for wider use by the Thompson Materials Corp., New York City, to which Mr. Bean has transferred patent and sales rights. As illustrated by the drawing and photographs, the keyway simplifies the operation of installing transverse dowel bars in concrete pavement constructed one lane at a time. The design is readily adapted to manufacture in various dimensions required by different specifications, and the keyway can be furnished with adjustable dummy fillers between bolted portions to take care of any variations in dowel bar spacing or transverse expansion joint spacing.

Primary advantage of the device lies in the detachable cover member which fits over the open slot in the keyway after the longitudinal leg of the bent dowel bar has been placed in the trough. The detachable cover permits dowel bars to be inserted at the last minute before concrete is placed, and, even more important, it allows form strippers to remove the keyway without first straightening the bent leg of the tiebar. Common practice with ordinary keyways requires this leg to be straight-



COVER MEMBER is dropped in place on keyway after dowel bar has been installed. Note two-layer slab reinforcement placed prior to installation of dowel bars, thus avoiding interference.

ened while the keyway is pulled and then bent back against the slab to allow operation of fine grading equipment in the adjacent lane.

Fabricated in two members, of 14-gage cold-rolled steel, the new keyway breaks loose with light tapping, leaving no spalled

(Continued on page 96)

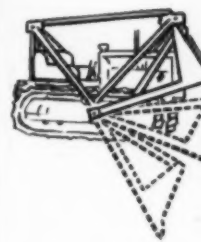
FOR
TOUGH CONDITIONS
USE LETOURNEAU
'DOZERS



LeTourneau 'Dozers are built for earth-movers who want a unit that can take the punishment of heavy clearing, pioneering rock cuts, etc. with a minimum of time out for repairs. They've made such a hit with successful contractors that for years LeTourneau 'Dozer volume has been the largest in the industry. Here are a few reasons why:



Plow-like digging angle gets blade into ground quickly, rolls big loads with ease. It's a digging fool.



Fast, sure-acting cable control delivers instant power to the blade whether it's 110 or 40 below.

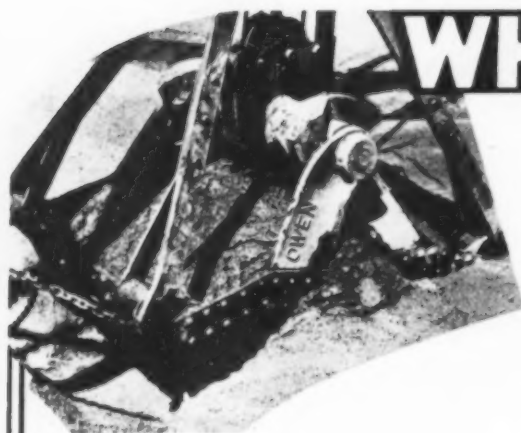
High lift and low drop (as much as 120 inches between extremes in some models) give you plenty of operating range for clearing trees, stumps and rocks or for throwing up levees and banks. Long low drop, possible only with cable control, permits 'Dozer bowl to follow load over steep banks.

Stout, all-welded construction gives you great strength with a minimum of weight.

PARTS AND SERVICE—Available in more than 100 cities in the U. S. and 80 foreign countries.

Ask your LeTourneau—"Caterpillar" distributor to show you . . . on your own job . . . how these stout, fast-acting 'Dozers can save you money NOW.

LETOURNEAU
PERDUE, ILLINOIS LOS ANGELES, CALIFORNIA



WHEN OWENS

perform

SAND *is moved* PROFITABLY

Speed and More Speed is the cry on construction jobs and industrial projects.

Setting the pace in bucket designing, Owen Engineers have still further improved Owen buckets in performance features and endurance ability.

For big grabs and a "mouthful at every bite" specify an "Owen Bucket."

The OWEN BUCKET Co.

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Branches: New York, Chicago, Philadelphia, Berkeley, Cal.



KEYWAYS AND DOWEL BARS are in position ready for concrete on Pennsylvania Turnpike contract of W. L. Johnson Construction Co., Hicksville, Ohio.

(Continued from page 95)

edges. Because it allows installation of dowel bars just ahead of the paver, the unit eliminates interference with placement of a bottom mat of reinforcement mesh, where two layers of steel are used.

State highway departments of Massachusetts, Connecticut, New York and Pennsylvania have approved the keyway, and it has been used on projects in those states. Similar approval has been given, and use of the keyway has been made, on contracts of the Pennsylvania Turnpike Commission, the Triborough Bridge Authority, the New York City Department of Parks and the Westchester County Park Commission.

★ ★ ★

Safety

For Maintenance Men



AS SAFETY MEASURE at Prado dam, U.S. Engineer Department earth fill project being built in California by Prado Constructors Inc., props are required to be set to support tractor cultivator attachment when in raised position for adjustment or repair. Rules require that props always be used to prevent accidental dropping of raised truck bodies, bulldozer blades and other equipment held in place either by hydraulic pressure or friction.

Reduce Batch Equipment for Carrying Cement to the Minimum of Weight — Space — Cost.



TURN-O-MATIC CEMENT BOXES FOR BULK CEMENT

These boxes are easily installed, close to the front of the batch compartments, and deliver cement at the RIGHT time, in PERFECT condition. When dump body is raised to discharge batches, TURN-O-MATIC Boxes are automatically inverted—discharging cement at same time as aggregate, without splash or dust. Eleven and fifteen cu.ft. capacity Boxes available.



HERCULES STEEL PRODUCTS CO. GALION, OHIO

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WORTHINGTON
in '41

**Leads to
MORE PROFIT
in '41!**

It will pay you to believe this sign . . . and use more Worthington Rock Drills, Air Tools and Portable Compressors. You'll pocket a good slice of the money normally put into operating and maintenance expenses when you take advantage of the "cost-cutting" features of these Worthington Products. Join the fast-growing army of contractors and maintenance men . . . who now are letting "MORE WORTHINGTON IN '41" lead them to "MORE PROFIT IN '41."



Here are three Worthington 315' gasoline portable compressors synchronized to operate as a single unit supplying air to a concrete placement unit for the Sanitary District of Chicago. Fifteen Worthington compressors are now being used by this customer on the Chicago Sanitary Sewer System. Eight of these were purchased last fall, and their ability to "stand up and deliver" under the toughest conditions resulted in a recent order for seven more 315' gasoline portables.

Worthington Leading Features

ROCK DRILLS AND AIR TOOLS

DESIGN: Skilled, scientific designing results in low air consumption, high rate of penetration—and a tool that is easy on the operator.

QUALITY: Forged steel throughout, precision-made parts, and highest skilled workmanship guarantee ruggedness, long life and low maintenance.

SPECIAL FEATURES: In certain Drifters and Hand-Held Drills such exclusive Features as Independent Rotation, Pneumatic Feed and Hole Spotters result in lower cost per foot of rock drilled.

PORTABLE AND SEMI-PORTABLE COMPRESSORS

Worthington Compressors are designed for HEAVY-DUTY, MODERATE SPEED service resulting in maximum overall performance with long life and low maintenance cost. These benefits result from—

- TWO STAGE AIR COOLING
- FEATHER VALVE
- ARTICULATED CONNECTING ROD
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- ENCLOSED CLUTCH
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- SIX-CYLINDER ENGINE
- SECTIONALIZED RADIATOR AND INTERCOOLER
- STRUCTURAL STEEL ALL-WELDED FRAME
- ROLLER BEARING WHEELS

There is a Worthington Distributor or Branch Office in your area that will give you prompt local service.

WORTHINGTON



WORTHINGTON PUMP AND MACHINERY CORPORATION, HARRISON, N. J.

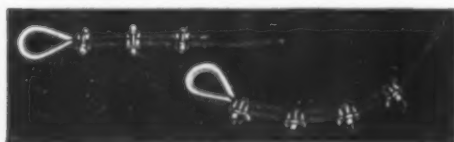
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**HOLYOKE COMPRESSOR AND AIR TOOL DEPARTMENT
HOLYOKE, MASSACHUSETTS**

PC1-2



A Laughlin drop forged Safety Clip takes hold of wire rope with a sure, solid grip — just like a fist. It's no rope crimping "finger pinch," but a rugged vise-like hold. Tests have proved Laughlin Safety Clips twice as efficient as ordinary "finger pinch" U-Bolt clips.



SAVES WIRE ROPE. There's no bowing or distortion of wire strands in rope secured with Laughlin Safety Clips. So — no wire has to be discarded after Safety Clips are removed — with a resultant saving to you.

FASTER TO APPLY. Laughlin Safety Clip nuts are on opposite sides — easy to get at. Two wrenches can be used at once — you save lots of time clipping rope this *modern* way.



Write for free booklet describing many money-saving features of Laughlin safety clips. Also gives results of recent tests by a great engineering school, proving Laughlin Safety Clips 50% more efficient. Fill out coupon — today.

THE THOMAS LAUGHLIN CO. Portland, Maine

Please send me free Safety Clip booklet G-6

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Check here for catalog on items below ☐

Look for Laughlin products in Thomas' Register and buy through your distributor.



10-Mile Belt Conveyor Delivers Gravel for Shasta Dam Concrete

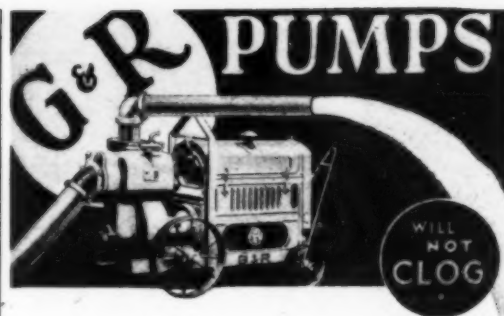
AFTER MAKING A 10-MI. TRIP on the world's longest belt conveyor system between Redding and Coram, Calif., sand and gravel for concrete at Shasta dam, U.S. Bureau of Reclamation project in California, passes along this terminal trestle and rattles down the baffles of vertical "rock ladders," shown at left and



ROCK LADDERS, equipped with baffles, distribute gravel from belt conveyor on trestle to storage bins.



TERMINAL of 10-mi. belt conveyor system is long steel trestle over storage bins with six compartments for various sizes of sand and gravel.



The Most **DEPENDABLE** Pump For The Least Money

Claims of fastest priming, highest suction lift, more gallons per minute, etc., do not pump water. On the job, the pump must do its own talking, and with dirty water, many a pump is inclined to stutter — and stop.

Let G & R Pumps tell you their own story on any job. They will deliver as much, and usually more, water under any condition, than any other pump. We will ship you one and let you be the judge.

Remember this about G & R Pumps — **THEY WILL NOT CLOG — THEY ASK NO TIME OUT.** Play safe! That is why more contractors are standardizing on G & R Pumps than on any other make.

Distributors in 100 principal cities are ready to make prompt delivery of the G & R Pumps you need.

THE GORMAN-RUPP CO. Mansfield, Ohio



A Knockout Blow!

to large, cumbersome compressors on many of your jobs

SMITH AIR COMPRESSORS are lightweight, sturdy and exceptionally low-priced

Consider these many advantages over heavy, expensive compressors: Move the Smith easily from one job to another. Tow it at permissible truck speeds. Made with FORD MOTORS and standard parts it is rugged, efficient. Repairs and parts available at any Ford garage. Priced far below standard compressors of equal capacity. 60 cu. ft. size uses only 1 gal. of gasoline an hour. Head equipped with high speed compressor valves; automatic unloading and idling. All the power you'll need for a majority of compressor work.

With a Ford Motor and shop facilities you can assemble your own compressor. We will furnish a Smith Compressor Head and Accessories with complete instructions for mounting.



Write for FREE booklet
GORDON SMITH & CO.
490 College St., Bowling Green, Ky.



TEN-MILE TRIP by belt conveyor is made by sand and gravel up to cobble size in 1 hr. 40 min. Belt trough width is 36 in.

right of accompanying illustrations, and piles up in storage bins at Coram, just downstream from Shasta damsite. The six compartments for various sizes of gravel and sand are each 60 ft. wide and 150 ft. long, with an aggregate-storage capacity of 150,000 tons—about one week's supply. More than 10,000,000 tons of sand and gravel will be used by Pacific Constructors, Inc., for the manufacture of concrete at Shasta dam, main feature of the Reclamation Bureau's Central Valley project.

For the 10-mi.-long conveyor system, which has a belt trough width of 36 in., the Goodyear Tire & Rubber Co. used 1,000,000 lb. of rubber and 1,000 bales of cotton for the six-ply belting. The conveyor has a capacity of 1,100 tons per hour. The trip by conveyor from Redding to Coram takes 1 hr. 40 min.

★ ★ ★

Improved Roofing Sheet Lead

IMPROVED TYPE OF ROOFING SHEET LEAD, called Roofloy, which is claimed to be of lighter weight, of greater tensile strength, to cost less to install and to be less liable to creep, has been introduced by Revere Copper and Brass, Inc., of New York City. This roofing calls for but 2 lb. per square foot for most needs, while accepted roofing standards call for minimum of 3 lb. Available in sheets 30x96 in., weighing 40 lb. Resistance to creep said to be ten times that of soft lead, providing safe assurance against creep damage or failure and permitting use of Roofloy for steeper slopes than those considered safe for ordinary lead at present.

Porto-Power to the Rescue..

TROUBLESOME emergencies fade like magic before the speed and all-purpose utility of Porto-Power Jacks! It conserves man-power and meets today's demand for **MORE SPEED** on construction and changeovers. Remotely controlled, all-directional hydraulic rams, ranging from 2 to 50 tons capacity, make short work of 1001 push, pull, lift, bend, straighten jobs, including bending up to 4-inch pipe



NEW ATTACHMENT — Toe-Lift gets under machines, transformers, and equipment as low as 3 1/2" from base — lifts 10 tons up to 8 1/2". A vital necessity for lifting, placing and relocating heavy units. Furnished in S-79 Kit.



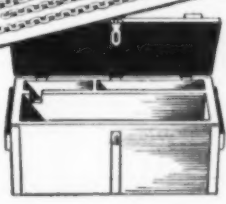
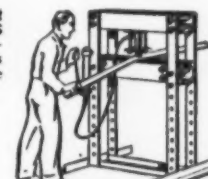
ANY SPAN — ANY ANGLE!
Ram is all-directional. Extensions eliminate dangerous blocking-up!



PULL GEARS, PULLEYS AND WHEELS smoothly, safely, quickly... without damage.



BUILD YOUR OWN PRESS for use with 20-ton ram! Press blueprints are FREE.



"PORTO-POWER" is portable hydraulic power — "harnessed" to do the same basic jobs performed by the human hand — with tons of strength! Think of the 1001 tough jobs such equipment can do for you on tough construction problems. Get this new S-79 Kit of 20-ton equipment and eliminate back-breaking, expensive trouble. Write for new "Porto-Power" catalog or see your Industrial Supply Distributor.

GET THE NEW BLACKHAWK HYDRAULIC EQUIPMENT GUIDE Packed full of ideas, suggestions, use-pictures, short cuts — it shows you how to speed up work with many new and revolutionary hydraulic methods. Get it from your Industrial Supply Distributor, or write us direct.
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WORLD'S LARGEST MANUFACTURER OF HYDRAULIC JACKS

BLACKHAWK MFG. CO.
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Please send new catalog featuring Blackhawk Hydraulic Hand Jacks, Gauge-Equipped Jacks, Porto-Power Remotely Controlled Jacks, Pipe Benders and Wrenches.

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*It's New—
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Corrugated STEEL SHEET PILING



THE UNION METAL MANUFACTURING CO., Canton, Ohio

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CM 6-41

NEWS FROM MANUFACTURERS *About Their Products*

The publications reviewed below, will keep you posted on latest developments in construction equipment and materials available for your use

WATERPROOFING AND DAMPPROOFING—Koppers Co., Tar and Chemical Division, Pittsburgh, Pa. (four 4-p. pamphlets) Technical literature describing these operations on concrete and brick foundations, precast concrete, piles and slabs, and for waterworks and sewage disposal plants. (1) "Membrane Waterproofing" tells when waterproofing and dampproofing should be applied. Respective values of fabric and felt are described and methods of application pictured and discussed. (2) "Dampproofing" distinguishes between dampproofing and waterproofing, tells when each should be used and describes how to dampproof poured concrete, concrete piles or slabs, foundation blocks, floors and sub-floors of superstructures. Also describes termite proofing by pitch method. (3) "Waterproofing and Dampproofing for Waterworks" discusses circumstances under which these treatments are necessary and provides table of recommended applications for pipe galleries, foundations, sumps, clear water wells, dams, pits, reservoirs, vats, tanks, steel work, tunnels, covered storage tanks, pipe and precast concrete. (4) "Waterproofing and Dampproofing for Sewage Disposal Plants" describes value of these applications and gives instructions for water and dampproofing aeration, sedimentation and grit chambers, drying beds, pipe galleries and control rooms, concrete sewage pipe and foundations.

★ ★ ★

BLOCKS AND SHEAVES — American Hoist & Derrick Co., St. Paul, Minn. (16 pp., illustrated.)

Wire rope blocks are available in two classifications: heavy duty and standard. Sizes range from single to 7-sheave blocks, with outside sheave diameters up to 20 in. Capacities up to 80 tons. Plain, self-lubricating bronze-bushed and anti-friction bearings. Shackle or swivel hook. Also heavy wire-rope snatch blocks. Extensive line of hooks and shackles, in addition to sheaves up to 47 1/4 in. in outside diameter. Tackle block ratio table indicates how to figure number of parts of line required for various loads.



★ ★ ★

DIESEL HEAVY-DUTY TRUCKS — Dodge Division, Chrysler Corp., Detroit, Mich. (19 pp., illustrated.)

Latest developments in diesel power for truck transportation, including a section on the operation of Dodge diesel job-rated trucks under many different hauling conditions. Details and simplified explanation of "full diesel" principle. Chassis features and dual-purpose diesels are described. Specifications and available extra equipment are listed. Diesel trucks are claimed to save from 30 to 55 per cent on fuel cost. Fuel supply to all cylinders is regulated by single rotary valve. Electric manifold heater and 24-v. starting motor. Two rear-axle gear ratios in same truck. Four standard wheel bases: 152, 170, 188 and 205 in.

★ ★ ★

CENTRAL PLANT BITUMINOUS MIXES — Barber-Greene Co., Aurora, Ill. (24 pp., illustrated.)

Central mixing of higher-type bituminous mixes with complete control of aggregate gradation is clearly presented in 1940 Performance Data and Laboratory Reports of four separate jobs utilizing pneumatic-tired mobile equipment for drying, gradation control and continuous mixing. Booklet prepared for engineers, contractors and users of bituminous mixes includes reports on mix analyses of four jobs, flow diagram of complete central plant, inspection control procedure, advantages of the portable continuous-mixing plant, and suggested specifications covering both results and method.

TELSMITH

flexibility
FITS THE PLANT TO ITS MARKET



● Faced with a diminishing deposit, the Kelly Run Stone Co. decided early in 1938 not only to open a new quarry higher on South Mountain but to erect a completely new 125-150-ton-per-hr. rock crushing plant about six miles southeast of Wilkes-Barre, Pa.

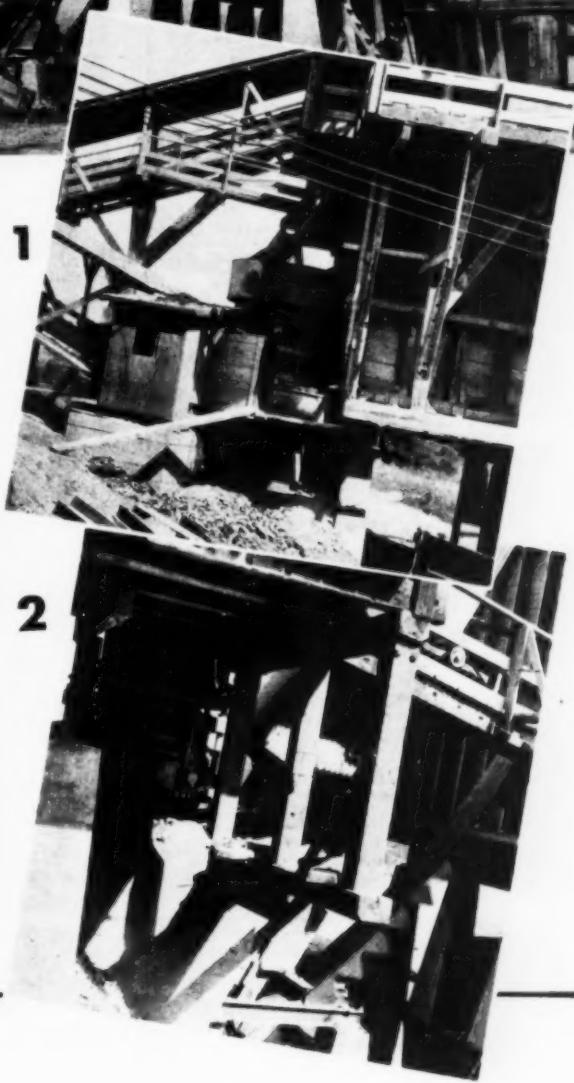
Their well established market demanded products to suit widely varying specifications. This called for a plant of extreme flexibility. They have just that. Its design and construction was supervised by their Gen. Mgr., B. C. Banks, with Tel-smith's engineering co-operation.

In large part this plant's flexibility is due to its Tel-smith equipment. The 72" x 25' Tel-smith Roller Bearing Rotary Scalping Screen insures quality grading and cleanliness. Plus 4" rock or tailings from scalper are chuted to the 13-B Tel-smith Gyratory Secondary Crusher (Fig. 1) and its product in turn goes back to the scalper. Thus either ballast or modified base coarse stone may be produced in the scalping bin and trucked from there. The "parallel pinch" of the Tel-smith Gyratory quickly reduces large pieces at top of bowl. Operating at an eccentric speed of about 220 rpm, its capacity is high. And its super-strong steel frame and crown and unbreakable shaft insure continuous output.

A No. 36 Tel-smith Gyrasphere Crusher (Fig. 2) serves as a finishing crusher, taking raw feed from scalping bin, also tailings and unwanted sizes from main bin. By varying percentage of feed and crusher's settings, proportions are controlled and various sizes in the amounts needed are produced.

Four finishing screens produce a total of 6 possible sizes, in addition to dust—two 4' x 10' Tel-smith Double Deck Pulsators delivering 3 sizes to main bin compartments on one side of elevator, and two other screens delivering to other side.

Do you want flexibility in your plant, with low-cost operation and maintenance? Write for Bulletin Q-10.



Q-5

SMITH ENGINEERING WORKS, 510 EAST CAPITOL DRIVE, MILWAUKEE, WISCONSIN

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North Carolina Eqpt. Co.
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Toronto, Ont.

DOUBLE TROUBLE MR. X'S WATER AND HIS GAL "HONEY COMB"



"DISPERSE" THEM OFF YOUR JOB WITH POZZOLITH

Why allow Excess Water to penalize you when you can reduce it? Why put up with Honey Combing and the consequent costly repair if you don't have to?

Use POZZOLITH and reduce excess water immediately. Only POZZOLITH added to regular portland cement disperses the cement particles, cuts mixing water up to 20%, and produces greater compressive strengths than undispersed cement.

POZZOLITH—dispersed concrete has easier placeability, less permeability, greater durability. Forms strip sooner, and surfaces are superior in appearance.

Speed up your job, get better concrete faster, with POZZOLITH.

HOW POZZOLITH WORKS

Cement particles in their normal state in water tend to gather together in bunches; i.e., flocculate. This bunching also entraps water within the particle clumps. (See cut below).



With Master Builders' dispersing agent these bunches are broken up into individual cement particles distributed through the water; i.e., dispersed or deflocculated. (See cut below).



This dispersion makes the cement usable to its full efficiency; all the cement surface is made available for hydration and all the water for lubrication of the mix. (Water held within the particle clumps is released):

The results are:—
Greater workability with less water.
Increased strength.
Watertightness.
Durability (Resistance to freezing, thawing, and corrosion.)

The complete story of "Cement Dispersion" will be sent on request. Ask for Research Paper No. 35.

There are two kinds of POZZOLITH, Standard and High Early. High Early provides all the advantages of Standard plus high early strength. Send for the complete story.

THE MASTER BUILDERS COMPANY
Cleveland, Ohio Toronto, Canada

MASTER BUILDERS

Circular Drill Jumbo Carries Six Drifters on Three Radial Arms

(Continued from page 39)

carrying ladder ring, 18 ft. 3 in. in diameter, and a platform carriage which supports the ring on a large axle and provides for storage of drill steel and bits on the upper level and hose and miscellaneous supplies on the lower level. The big ring, made up of two circles of 6-in. and 3-in. steel channels, spaced 2 ft. 3 in. apart and connected by steps of 1-in. pipe spaced on 14-in. centers, is connected with the axle by four heavy steel spokes. From the axle three radial arms of 4-in. pipe, on each of which two drills are mounted, extend to the periphery of the ring. These radial arms are raised or lowered by chain hoists in order properly to spot the drills at the tunnel face. Drills may also be positioned at any point along the length of each radial arm. Drill operators are provided with platforms supported at several levels by 2-in. pipe scaffolding. Four hydraulic jacks make it possible to raise or lower the ring for purposes of adjustment to drilling requirements.

A feature of the design makes it possible to tilt the circular jumbo to accommodate drilling where tunnel grades range from 20 to 27 and also to facilitate movement of the machine by tractor haulage back from the face. The rig is mounted on a carriage equipped with a pair of 13.15x20-in. balloon tires spaced 12 ft. apart.

★ ★ ★

Long-Span Timber Trusses Support Roof of Aircraft Plant

(Continued from page 64)

sion program. Contracts for construction were signed early in October, 1940. The first carload of fabricated truss members left Portland, Ore. for Wichita, Kan. Oct. 14. Erection of trusses began Nov. 8 and the frame structure was completed in 60 working days after receipt of the signed contract. By the end of December about 8 acres of plant extension, comprising the entire project, had been roofed over.

Glued-up laminated columns were used to support the Douglas fir arch Teco type trusses. The larger trusses, those of 100- and 140-ft. lengths, were prefabricated at Portland, Ore. Smaller trusses were fabri-

KEEP LOW BIDS
IN THE
PROFIT COLUMN



Mall Vibrator With Exclusive Patented Vibrating Element Placing Concrete

With Mall 9-Job PORTABLE POWER UNIT

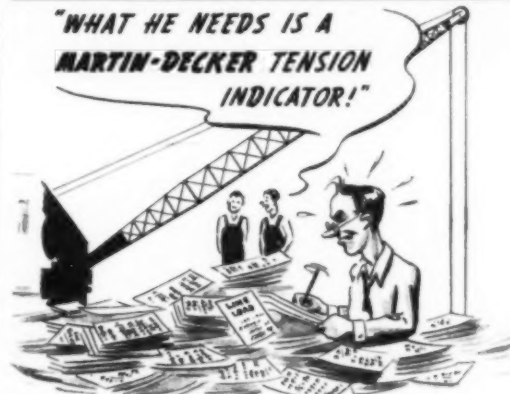
Think what this MALL time and labor-saving portable power unit would mean on your low-bid jobs. It delivers dependable, low-cost power for Concrete Surfacing, Concrete Vibrating, Form Sanding, Sawing with Circular or Chain Saw, Drilling, Pumping, Grinding, Sharpening Tools and Wire Brushing. It cuts tool investment, reduces idle tool-hour losses, clips maintenance costs, conserves storage space and operates all day on 1½ to 2 gallons of gasoline. All attachments are quickly interchangeable and precision-fitted to speed up the job. So easy to keep busy and economical to operate it will repay its cost before you know it.

Write Today for a Free Demonstration and 1941 Catalog.

MALL TOOL COMPANY
7757 South Chicago Avenue
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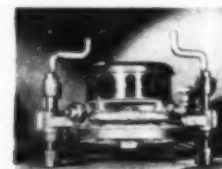


"WHAT HE NEEDS IS A MARTIN-DECKER TENSION INDICATOR!"



There's no need for mathematical calculations with a Martin-Decker Tension Indicator handy. It accurately shows—without paper figuring and without deadending—the actual load in pounds as it falls on the line. It catches sudden damaging impact loads as well as strong, steady pulls, enabling you to make any needed adjustments to insure maximum safety, efficiency and economy of your wire lines in the field.

Simply clamp the instrument to the line and read the dial—no wrenches required! Three models—Miniature, Standard and Heavy Duty—cover line sizes from 3/16" to 1¾". All models adjustable for changes in temperature. Write for details on the Martin-Decker Tension Indicator, and ask also about the Measuring Line Weight Indicator.



MARTIN-DECKER CORP.
LONG BEACH, CALIFORNIA

Byers PERFORMANCE sets records that are HARD TO BEAT



● A Byers $\frac{3}{4}$ yd. in Washington State ripped up solid 8 inch concrete pavement. A $\frac{3}{8}$ yd. Bearcat Jr. in Camden, N. J. dug 50 yds. of moulding sand per hour. A $\frac{1}{2}$ yd. Model 60 at Mammoth Cave, Ky. loaded 1000 yds. of dirt in 8 hours into trucks. A Model 65 drag-line in Florida averaged 1200 yds. in 10 hours on a drainage job using $\frac{1}{2}$ yd. bucket.

These typical performance reports constitute another reason why you should investigate Byers.

11 FULLY CONVERTIBLE MODELS IN $\frac{3}{8}$ - $\frac{1}{2}$ - $\frac{5}{8}$ - $\frac{3}{4}$ YD. SIZES

Modern CRANES and SHOVELS

BYERS

RAVENNA, OHIO

COFFING

SAFETY PULL RATCHET LEVER

HOISTS

**PAY FOR
THEMSELVES
MANY TIMES
OVER IN SAVINGS**

When a Contractor is more or less on his own on a job he wants equipment that gives trouble-free, day-after-day service with as little attention as possible—that's why so many Contractors like the Coffing Safety-Pull Ratchet Lever Hoist. It stands abuse—it's fool-proof because of its many safety features—and it's easily moved about when needed.

The initial cost of the Coffing Safety-Pull Ratchet Lever Hoist is small and it meets the demand for a heavy capacity hoist that is easy to operate and transport. The innumerable lifting, pulling, and moving jobs that crop up can be handled with speed, safety, and economy. Sizes range from $\frac{3}{4}$ ton cap. which weighs 14 lbs. to 15-ton cap. which weighs 150 lbs. There are many types from which to select one to meet your individual needs. Let us send you more detailed information on this time and money saver. Write for catalog No. CG-4.

COFFING HOIST CO.
DANVILLE, ILL.

COFFING ADVANCED DESIGN HOISTS

RATCHET LEVER — SPUR GEAR — ELECTRIC
LOADBINDERS — TROLLEYS — DIFFERENTIALS



cated on the job and the glued-up columns were built in a temporary building erected on the job for that purpose. The entire project called for a total of about 1,000 timber trusses, both large and small.

The bowstring trusses of 140-ft. span, of which 28 were supplied for the project, are spaced 53 ft. apart on centers, and are designed to carry loads of about 180 tons. In fabricating the trusses at Portland, removable double-headed nails were used to hold the members firmly together in true alignment during boring and framing operations. Shims also were inserted between chord members to provide proper spacing where heel-straps were to be inserted during construction, thus insuring proper alignment. In boring holes in the timber truss members, a pipe guide was inserted to obtain a straight hole with the electrically powered augers. Pieces of metal less than $\frac{1}{8}$ in. thick between members of the upper chord provide for absolutely uniform bearing and eliminate possibility of soft grain bearing on hard grain, which might produce rupture at the joint. No edge grain bearing is used, so that shrinkage will not affect connections at joints.

Relative to the project as a whole, the frame structure supporting the roof over an area of about 8 acres, in which there are only 30 interior columns, was erected in 60 working days after receipt of order. The Teco-connected main trusses supporting the roof consist of 28 bowstring units of 140-ft. span on 54-ft. centers and 28 flat Howe type trusses of 100-ft. span on 33-ft. centers. Architects for the plant buildings were Overend & Boucher, of Wichita; general contractors, Armagost & Moreland, of Wichita. Truss fabrication was done by Timber Structures, Inc., of Portland, Ore.

★ ★ ★

ARMY AND NAVY RUSH

*Southeastern
Defenses*

(Continued from page 51)

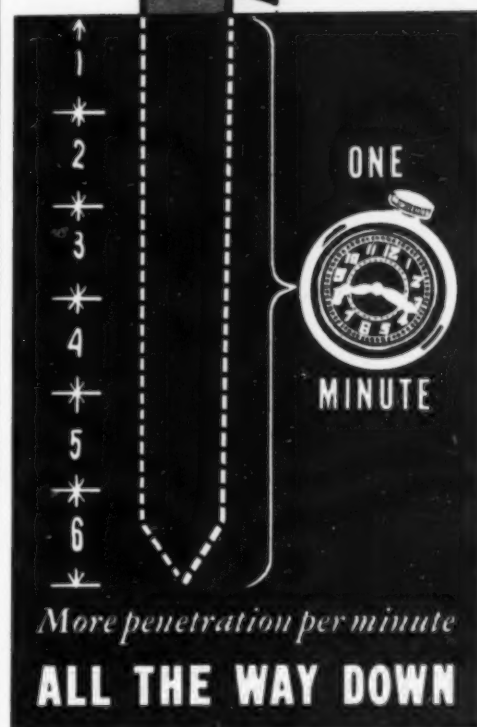
pipe, laid in trenches backfilled with stone, connecting with main trunk drains, and (3) drop inlets set flush with surface of the asphalt-treated shoulders, the inlets feeding drain pipes laid parallel with the runway edges and connected into main cross drains.

During construction, excavation below groundwater level is accomplished with the aid of close sheeting and pumps for trenches and well points for larger holes.

Foundations—Spread footings on sand, loam or clay with a safe bearing value of 2,000 to 4,000 lb. per sq.ft. support con-

(Continued on page 104)

SPEED



SUPER-VULCAN OPEN TYPE

DIFFERENTIAL-ACTING

PILE HAMMER

18C, 30C, 50C and 80C

We get reports of speed in pile driving like the above. You too can expect the utmost in fast, low-cost pile driving with the VULCANS you purchase.

One of the many ways you save money is that the Super-Vulcan uses 25 to 35 per cent less steam.

Rugged strength—simple design—positive action—durability—compactness are all points you should know about in greater detail.

The open type fits the same leads and uses the same accessories as the Vulcan Single-Acting Pile Hammers.



Sizes
18C—30C—50C—80C
meet all needs

VULCAN IRON WORKS

Since 1852
331 North Bell Avenue

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PAGE BUCKETS BITE RIGHT IN, TOO

There's no waiting around . . . no jockeying or recasting with a Page AUTOMATIC Dragline Bucket! It's ready to dig the instant it lands in the pit.

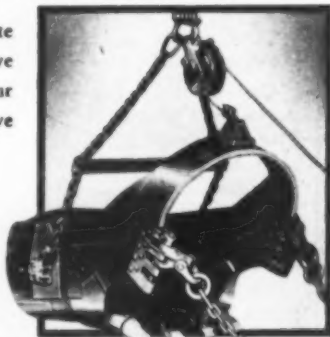
Why? Because the Page Bucket is designed to strike first on its forward arch . . . and then rotate back onto its teeth, using ALL its weight to DIG RIGHT IN. The first pull of the load line sets the teeth—and man, what a bite it takes!

No wonder operators by the score report that their PAGE buckets outdig any other bucket of equal size and weight.

It will be money in YOUR pocket to put a Page Bucket to work on YOUR job. They are available in sizes from $\frac{3}{8}$ to 15 cubic yards and come in three weight groups.

For full details write for our new descriptive bulletin titled "Your Dragline WILL Move Dirt Faster."

**PAGE
ENGINEERING
COMPANY**
Chicago, Illinois



PAGE
Automatic
DRAGLINE BUCKETS

Page Buckets are built in sizes from $\frac{3}{8}$ to 15 cubic yards capacity, and in three weight groups . . . a bucket for every job.

Address this Coupon to: DEPT. A-15, PAGE ENGINEERING CO.,
c/o CLEARING POST OFFICE, CHICAGO, ILL.

Without obligating me in any way, mail a copy of your new descriptive bulletin "Your Dragline WILL Move Dirt Faster."

Name

Street

City

State

(Continued from page 103)

crete foundation posts or walls under the temporary buildings. Where soil tests reliably indicate uniform, non-injurious future settlement under load, permanent structures in a few locations are placed on spread footings. In general, however, the heavier concentrated loads of permanent structures (hangars, shops, warehouses, barracks, power stations and water towers) rest upon precast concrete or timber piles.

Buildings—A marked distinction is made between permanent structures and temporary buildings designed for a useful life of 25 years, although the latter units are obviously sufficiently durable to have their lives extended beyond the designated limit by careful maintenance and regular replacement of such items as roofing. The more massive permanent structures make extensive use of steel, reinforced concrete, block masonry, and bonded, built-up roofing on wood sheathing. In the smaller permanent structures, designers for some projects have not hesitated to use wood framing with timber connectors and wood siding. For temporary buildings, wood framing, siding and roof sheathing are universally used, with either gypsum board or diagonal lumber for wall sheathing.

Notably rapid progress has been attained by the Navy Department in production of low-cost housing for married personnel. These houses, varying widely in design and materials of construction, have been planned and erected at high speed but, in spite of this fact, have achieved high standards of architectural, structural and mechanical excellence. Nominally designed for 25 years, the houses unquestionably are good for a longer life.

Utilities—Few projects are able to obtain adequate water supplies from existing municipal sources. Independent well supplies have been developed at nearly all sites. Elevated steel water tanks floating on the lines are used generally, no matter what the source of supply, to maintain pressures for fire fighting. Every project has its firehouse and automotive fire fighting equipment. Cast-iron pipe ordinarily is laid in the supply mains, and the distribution systems utilize either cast-iron or asbestos-cement pipe.

Except where projects can lay sewer outfalls directly into tidewater or into large streams, sewage disposal plants are included in the plans. Early occupancy of camps at some sites temporarily requires discharge of raw sewage into streams or large drainage ditches pending completion of treatment plants. All sanitary features of the projects are subject to regulations of state and local health departments.

Sanitary sewers are almost universally constructed of vitrified clay pipe with joints calked and sealed with bituminous composition filler. In the flat coastal area, sewage pumping frequently is required from central collecting wells to which the sewer lines deliver.

Steam heating lines for temporary hos-

(Continued on page 106)

Doing the IMPOSSIBLE in ROAD AND RUNWAY STABILIZATION

No matter what the stabilization job, — bituminous materials, soil cement, asphalt emulsion, dry mixing, sand clay, oil-mat or sand asphalt, the SEAMAN PULVIMIXER does the job at an astonishingly small fraction of the cost of other methods, — and does it better.

Bigger profits and quicker, more efficient and better operation demand your investigation.

THE SEAMAN PULVI-MIXER

2" Oil Mat Economically Processed in Place

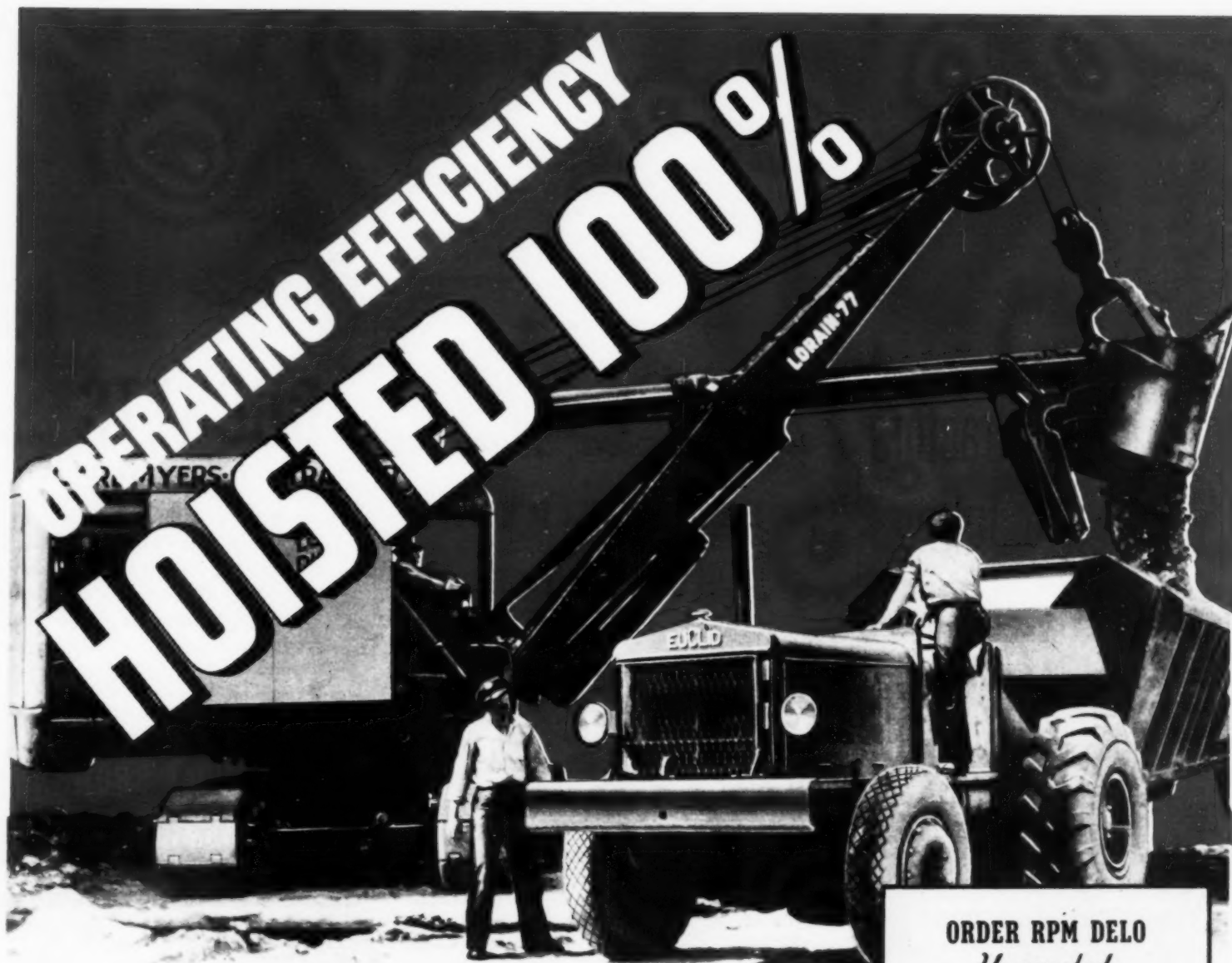
Mixing 181 tons Sand Asphalt per hr., Beaufort County, S. C.

Cleaning Soil for Stabilization (airport)

The SEAMAN MOTORIZED PULVI-MIXER

For Special Bulletin Write to

**SEAMAN
MOTORS**
MILWAUKEE, WIS.



Who says RPM DELO can do it? Lorain and Bucyrus-Erie shovels—Caterpillar Tractors—Le Tourneau Scrapers—bulldozers—Euclid Trucks—compressors, working for the Carl Myers Construction Company of Morristown, Ohio! States Mr. Myers—

"RPM DELO has been used by me for over 10,000 working hours and I find that the freedom enjoyed from ring sticking has reduced overhauls and increased operating efficiency 100%.

"At the moment we are working on the Belmont County, Ohio, job which involves moving three-quarters of a million yards of dirt, rock and shale. We are working against a set completion date and it is necessary that we avoid any costly breakdowns. We are

now ahead of schedule and we believe that through the use of RPM DELO we have protected ourselves against any unnecessary shut-downs..."

Save yourself shut-downs, overhauls, repairs. Besides stopping ring sticking, RPM DELO ends sludge trouble and has *unequaled* ability to stay put and lubricate "hot-spots." Other oils actually run away from them!



ORDER RPM DELO *Unequaled* FOR YOUR DIESELS

Approved by the makers of over 95% of the installed Diesel horsepower in America, RPM DELO is marketed under the following names:

RPM DELO
Kyso RPM DELO
Diol RPM DELO
Sohio RPM DELO
Signal RPM DELO
Caltex RPM DELO
Imperial RPM DELO

Ask your Diesel engine manufacturer or distributor for the RPM DELO supplier in your locality.

UNEQUALED FOR EVERY DIESEL

STANDARD OIL COMPANY OF CALIFORNIA



Experienced Contractors Use THESE Couplings

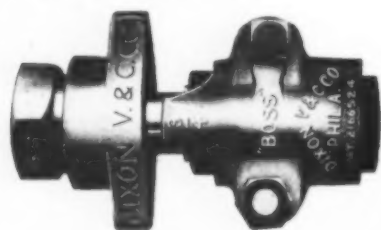
TO INSURE STEADY PROGRESS
ON THEIR TOUGHEST AIR JOBS



"GJ-DIXON"

GROUND JOINT
AIR HAMMER COUPLINGS

The tougher the service, the more evident is the dependability of this efficient air hose coupling. The ground joint construction... copper insert in spud fitting tight against rounded head of steel stem... provides a perfect soft-to-hard metal seal that remains leakproof, regardless of wear or the presence of abrasive particles. No worn-out or lost washers to replace. Furnished with either male or female spud. Compact Type, Style XLD-41, 1/2" and 3/4". Heavy Type, Style XHD-52, 3/4" and 1".



"GJ-BOSS"

GROUND JOINT
AIR HAMMER COUPLINGS

The strongest and most efficient of all air hammer couplings. In addition to the ground joint feature, described above, the "GJ-BOSS" has the further advantage of extra strength provided by the sturdy malleable iron "BOSS" Clamp, which securely anchors entire coupling to hose and eliminates all possibility of blow-offs, leaks and pressure losses. Compact Type, Style XLB-61, 1/2" and 3/4". Heavy Type, Style XHB-72, 3/4" and 1".

Stocked by Leading Rubber Manufacturers
and Jobbers

DIXON

VALVE & COUPLING CO.

MAIN OFFICE AND FACTORY: PHILADELPHIA, PA.

Branches: Chicago • Birmingham • Los Angeles • Houston

(Continued from page 104)

pitals of Army cantonments and for large temporary barracks of at least one naval base are carried above ground as an economy measure. The overhead pipe lines are covered with 85 per cent magnesia insulation, and the supports are designed to eliminate line breakage caused by expansion and contraction.

At permanent airbases, electric power, light and telephone lines are buried in underground conduits. Many underground systems use asbestos-cement conduit, coupled with sleeves of the same material.

★ ★ ★

Prefabricated Lumber SPEEDS SHIPYARD BUILDING

(Continued from page 55)

by prefabricated lumber construction, are meeting this tremendous drain on their capacities is furnished by several of the plants in the Pacific Northwest, notably the Seattle-Tacoma Shipyard, which, until last April, hadn't laid a keel since the launching and outfitting of a small vessel back in 1924. As a result of the yard's abandonment at that time, only a small electric substation and a buried forest of long fir piling, which formed the foundations of the former plant, remained. The entire outer end of the original tract has been permanently reserved as a shipyard comprising about 95 acres of hard-packed fill, with its buried, well-preserved forest of piling.

Reconstruction of the abandoned yard was begun Oct. 8, 1939, to undertake construction of some vessels for the Maritime Commission. Ten weeks later, while finishing touches were being added to the necessary buildings, the keel was laid for the first of five diesel freighters. Approximately 2 1/2 acres of the plant site are under roof and there are also two 500-ft. building ways and outfitting dock and large storage space for shipbuilding material. More than 3,000,000 ft. of Douglas fir lumber went into this construction, most of it prefabricated in Seattle and Portland mills, the successful prefabrication being made possible by Teco splitting connectors and special heel plates.

The unique scaffolding layout for the shipways was also prefabricated and brought directly to the site. Great speed of assembly and provisions for possible future dismantling were attained by this type of scaffolding.

Among other important yards that are up to schedule through the use of fast and inexpensive timber construction, according to the National Lumber Manufacturers Association, are: Oregon Shipbuilding Corp., Portland; Shipbuilding Division, Willamette Iron & Steel Corp., Port-

(Continued on page 107)



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land, Ore.; Associated Shipbuilders, Inc., Seattle; Commercial Iron Works, Portland; Harbor Island Shipyards, Seattle; Lake Washington Shipyards, Seattle; Consolidated Steel Corp., Orange, Texas; North Carolina Shipbuilding Co., Wilmington, N. C.; Bethlehem Fairfield Shipyards, Baltimore; Maryland Drydock Co., Baltimore.

★ ★ ★

World's Fair Salvage SPEEDS NATIONAL DEFENSE

(Continued from page 57)

factors were overcome by putting increased pressure on wrecking operations with additional equipment and crews; the delays were not permitted to postpone scheduled completion dates.

Trylon and Perisphere—Steel is the outstanding material salvaged for defense use from the Fair. Volk's contract involved 15,000 tons, of which more than 3,000 tons came from the 610-ft. Trylon and the 180-ft.-diameter Perisphere. Because of their



BOLTED STEEL FRAMES of Fair structures are salvaged intact by wrecking contractor for sale to Navy, Army or manufacturing concerns working on defense contracts.

unusual size and design requirements, both of these structures had been built with riveted connections. Demolition of the two steel frames was essentially the reverse of erection, segments being cut and removed by an orderly process which prevented overstressing and distortion of members remaining in place. Most of the steel from

(Continued on page 108)



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Also BLOWERS, HAND AND BENCH
GRINDERS, FLOOR SANDERS

(Continued from page 107)

the Trylon and Perisphere was sold as scrap to the Bethlehem Steel Co., engaged in filling large national defense orders; a small portion was bought by a company which reworks the steel into bolts, spikes and rods.

Riveted steel members of the two large structures were flame-cut with oxyacetylene torches into convenient sections for handling. Steel from the Trylon's slender top section, sheathed in steel plate for a distance of 125 ft. below the peak, was lowered to the ground by using one of the three column legs as a boom to support hoisting sheaves. As demolition of the structure progressed towards the ground, the Trylon widened to a triangular area of sufficient size to permit use of a guy derrick.

Guy Derrick Operation

Because of the restricted area available inside the Trylon, the contractor was unable to follow normal procedure in using the wrecking derrick. To obtain sufficient spread for the guy ropes it was necessary to tie the guys to the Trylon steel frame at a level about halfway down the 90-ft. mast of the derrick. As a result, the derrick was able to strip steel for only half its height at each set-up, requiring twice as many derrick jumps as in ordinary demoli-



DESTINED FOR NAVY PROJECTS. hundreds of wash basins and other fixtures are crated in contractors' temporary warehouse on site.

tion work. Wrecking of the Trylon steel required about 40 working days.

Oxygen and acetylene tanks to supply the cutting torches were hoisted by the derrick to the working platform at derrick level, where the acetylene tanks were hooked into manifolds to serve the torches of the steel burners, three acetylene bottles being used with one oxygen cylinder. Only two burners were able to work on the Trylon; they used No. 3 tips until demolition reached the heavy bottom steel, consisting of rolled and built-up riveted sections 2 to 5 in. thick. To burn these sections, the men

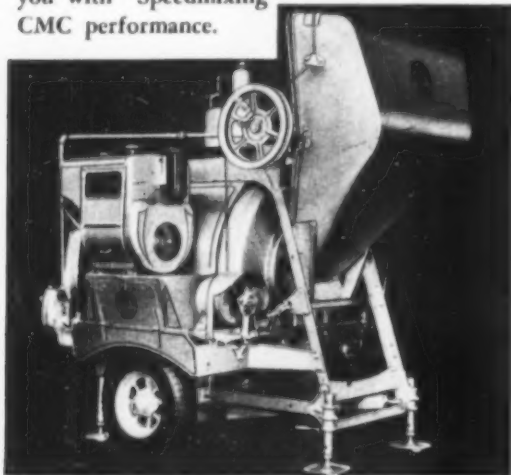
(Continued on page 110)

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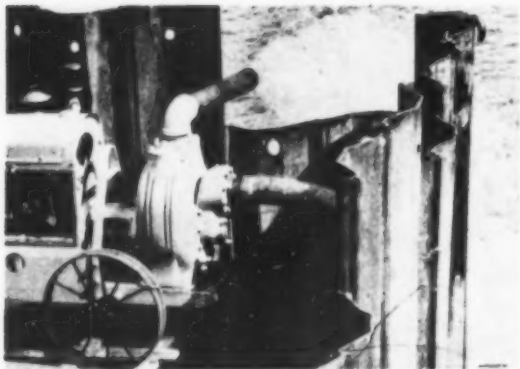
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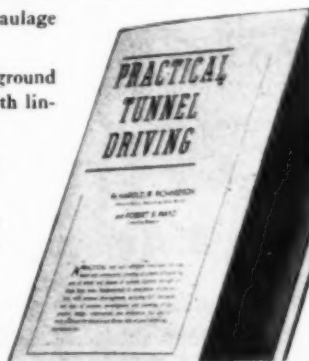
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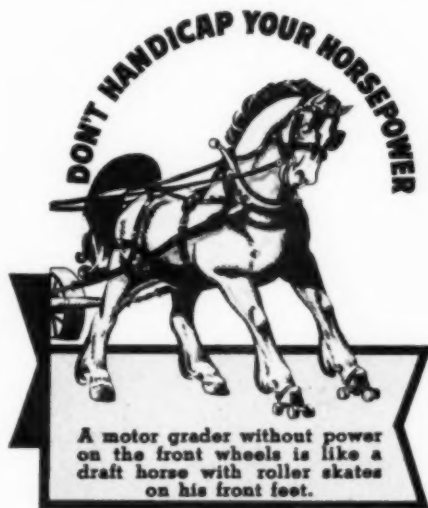
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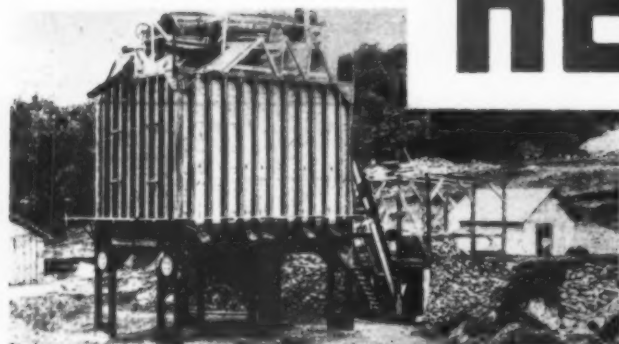


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"When you need TRACTION you need THORNTON"

(Continued from page 108)

employed No. 4 tips. The hazardous job of wrecking the Trylon was completed without so much as a scratched finger in the way of accidents. As a further commentary on the safe working habits of the ironworkers and wreckers employed by this contractor, it is worthy of note that the entire contract was completed without a single fatality.

In wrecking the steel frame of the Perisphere, demolition was carried down to a level approaching the horizontal diameter without benefit of any hoisting apparatus. The upper portion of the spherical skeleton was flame-cut in sections by the burners in such a way that each dismembered section was allowed to fall inside the Perisphere into the bowl-shaped bottom of the structure. As the demolition worked down toward the "equator" of the big steel sphere long-boom cranes were called into service to take a strain on each piece



POWER SHOVELS clear up wreckage and load debris into trucks.

being cut and to lower it to the ground. When this process had removed the steel skeleton down to the filled bottom basket, the cranes snaked out the trapped pieces over the edge of the remaining structure before proceeding with the final step of the demolition. The entire operation was completed in 10 working days.

Steel frames of all typical buildings at the Fair had been bolted to assure maximum salvage in demolition. The steel skeletons were dismembered by starting the nuts with hand wrenches and running the nuts off by hand to permit removal of the bolts. Frames of many of the buildings were purchased by manufacturing concerns which have re-erected the steel intact for shops, sheds and storehouses required in the expanded business of filling defense orders. Steel was shipped as far as Porto Rico and the West Indies. Other materials salvaged by the contractor, including 5,000,000 b.ft. of lumber and about 500 tons of pipe, have been utilized by the Army and Navy in construction of buildings at camps, bases and Navy Yards. The

(Continued on page 112)

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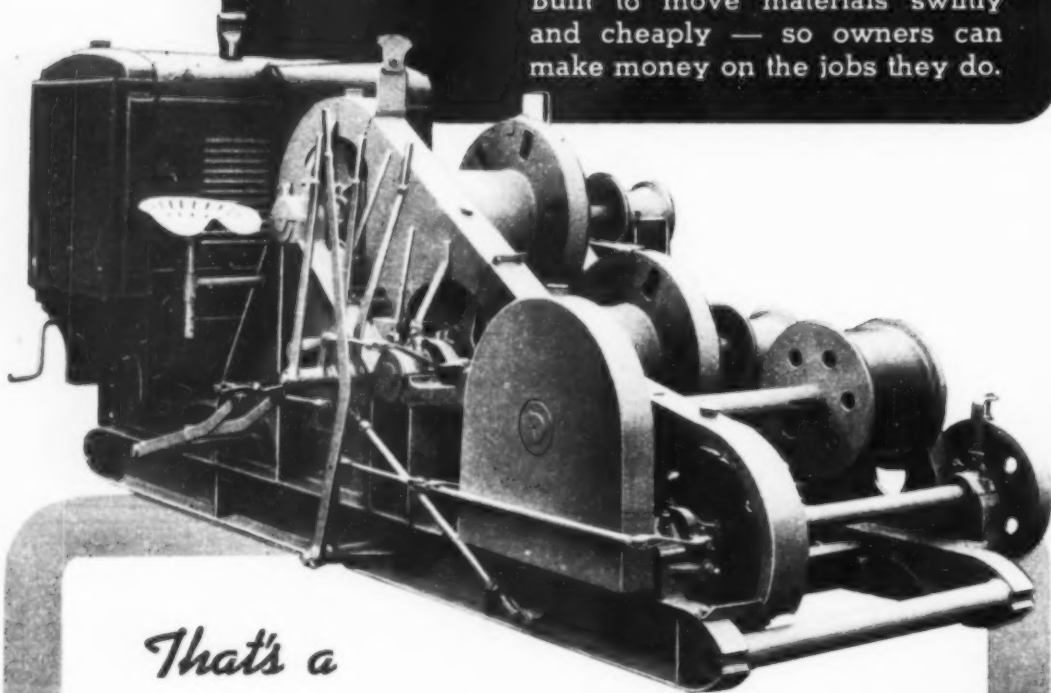
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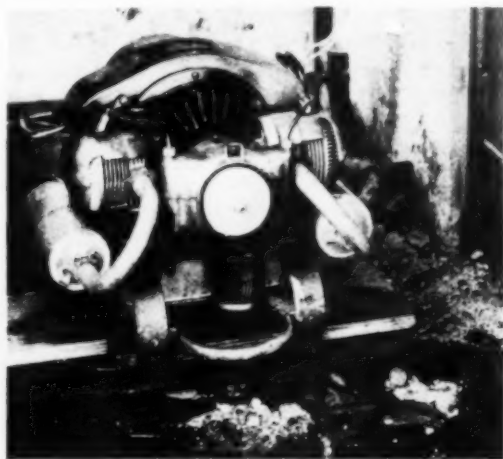
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write for CATALOG 100-H-1A.

(Continued from page 110)

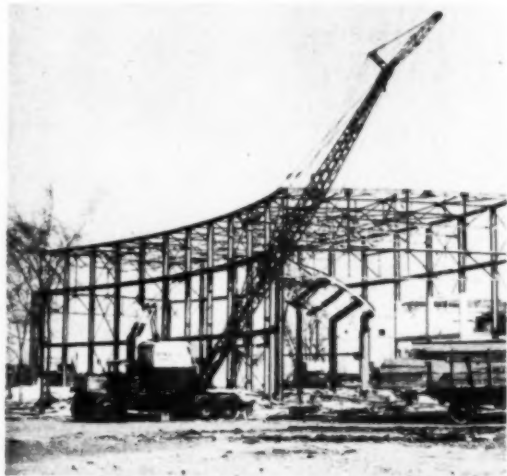
Navy purchased about 1,700 toilets, 1,100 wash-basins, 500 urinals and 300 fire hose connections to equip its current construction projects.

Exterior walls of typical steel-frame buildings consisted of stucco on plaster-board nailed to secondary wall framing of wood studs and plates. These walls were stripped in large, full-height panels by looping ropes around the wood framing



AFTER KEEPING AVIATION WARNING LIGHTS burning on Trylon during demolition, this 3,000-watt gasoline-electric generator set supplies current for lighting building used as temporary warehouse.

and pulling each roped section down with a truck. Steel-frame pylons up to 150 ft. high were dropped by burning hinge notches in the column legs near the base and pulling the pylons forward with cables hooked to tractors. Consideration was given to dropping the 610-ft. Trylon in a similar manner, and the method probably would have been used if it had not threat-

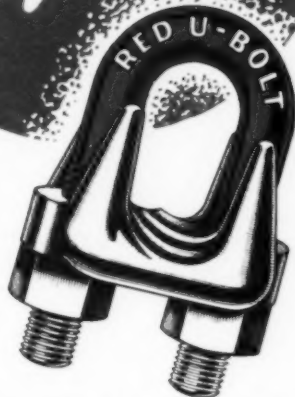


TRUCK CRANE dismantles bolted steel frame purchased by industrial manufacturer for building to be used in filling national defense orders.

ened damage to permanent underground utilities buried in the fill material which covers the soft marsh muck underlying the site. If dropping of the Trylon had appeared feasible, special precautions would have been required to control the direction of fall of the three-legged structure. One dome-shaped roof was brought down inside a ring of supporting columns by



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weakening the roof with a crane-handled iron wrecking ball which cut two intersecting strips through the sheathing and bent the steel pipe framing inward, allowing the structure to telescope and pancake to the ground.

Extensive use of heavy equipment was essential to completion of the huge demolition program on schedule. The Volk organization operated eleven power shovels, four crawler cranes, four truck cranes and three tractor-bulldozers. A maximum of about 500 men was employed by this contractor.

For the New York World's Fair, Inc.,



CAST-IRON WRECKING BALLS handled by power shovels and cranes demolish concrete structures.

Maxwell B. Harvey, director of operations, was in charge of demolition. Under the general supervision of A. K. Fleschner, president, operations of the Albert A. Volk Co. were directed at the site by Charles Fleschner, secretary, who was joined during the final months on the job by Michael Sheriff, treasurer. John A. Rutan and Robert Ginsberg were contractor's engineers in charge of foundation demolition, and John Ryan, iron foreman, handled all steel wrecking, including the Trylon and Perisphere.

★ ★ ★

Army Camp Paving **AT FORT ORD**

(Continued from page 62)

spread through special boxes attached to the truck tail gates. Although these boxes regulate the flow of stone chips so that a fairly even spread over the entire width to be covered is accomplished, hand spotting is usually required. After spreading, the key rock was bladed lightly to assure a somewhat uniform covering.

When the key rock had been thoroughly embedded by use of an 8-ton tandem roller, the next application of SC-6 grade liquid asphalt was made, followed by spreading and rolling fine screenings in the same

(Continued on page 114)



● Originally planned to be supported on some 11,000 wood piles, these tanks with their three quarter of a million barrels of oil storage capacity are standing today, as immovable as the Rock of Gibraltar, on foundations supported by only 2,700 Monotube Piles.

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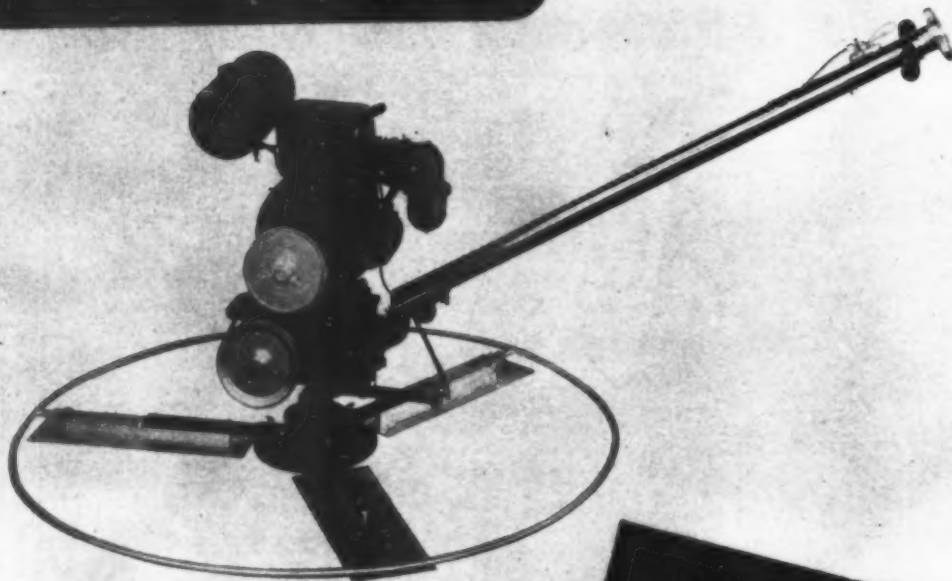
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(Continued from page 113)

manner as the key stone, thus completing the penetration macadam.

The total cost of the penetration rock base course and 3-in. penetration macadam, including final finishing of the road bed which had been rough graded was \$1.40 per square yard.

Light-Duty Paving

Supplementing the 3-in. penetration macadam used at Fort Ord, some 284,000 sq.yd. of company streets have been paved with mixed-in-place sand-asphalt, 2-in. thick. This material was put down for the full 30-ft. width of the company streets and the original intent was that it should be used only for the lighter traffic. Under light traffic it has been standing up very satisfactorily but unfortunately some of these company streets have been used for heavy traffic and under fairly high speeds —service of an order not contemplated in a pavement design costing, as this did, only 16c. per square yard. However, with repair facilities readily at hand it has seemed more important to make no restrictions on the traffic and to allow for such reconditioning of the surface as may be necessary.

For this lighter pavement, the existing sand foundation was mixed with SC-3 grade liquid asphalt (approximately equivalent to SC-4 under the revised specifications) to form a sand-asphalt pavement. A traveling pug-mill type mixer was used (made by George Gardner & Sons, Redlands, Calif.) working up material previously windrowed in quantities to form a 2-in. compacted layer.

In this operation, a highly important feature is the selection of sand with the proper grading. The SC-3 asphalt, at 200 deg. F. was introduced at the rate of 1½ gal. per square yard of completed pavement, the pre-heated liquid asphalt being supplied by a tank truck accompanying the mixer during the first trip. Two additional trips were required to complete the mixing.

Spreading of the mix windrows was accomplished with blade graders followed immediately by preliminary compaction, with a pneumatic tired roller. The top layer then was shaved off and respread by the blades to smooth out any irregularities that may have been developed by the compaction process. The pneumatic roller then proceeded with final consolidation (a flat-rimmed roller is usually preferred for final rolling). The cost of the completed 2-in. thickness of sand-asphalt mixture is 16c. per square yard.

Where the sand was uniformly graded from coarse to fine, the mixture is giving good service even though the streets are being subjected to considerable truck traffic. Where the sand consisted of grains of predominantly one size, however, the truck traffic is causing some damage. These areas will require correction of aggregate grading before successful construction can be accomplished.

The Fort Ord paving was finished on schedule despite wet weather that pre-

(Continued on page 117)

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The value of the BLAW-KNOX CONCRETE SPREADER is the ability of its transverse spreading blade to easily and effectively handle the top output of any paver . . . to spread concrete without segregation . . . to spread concrete as dry as $\frac{1}{2}$ inch slump . . . to spread and move concrete ahead without disturbing road form alignment.

Dump concrete anywhere on the subgrade and the spreader does the rest. It's a completely mechanical operation — the spreading blade action is automatic.

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chines, and vice versa. Vibratory attachment for the Blaw-Knox Concrete Spreader can be furnished if required.

Many tales of paving production reaching us sound almost fantastic, but they're true, and the contractors aren't a bit hesitant in telling about the job-getting and money-making ability of the Blaw-Knox Concrete Spreader.

If you plan to bid on road and airport paving, your figures can be revised downward if you use a Blaw-Knox Concrete Spreader.

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The Blaw-Knox Transverse Blade CONCRETE SPREADER

automatically spreads the concrete dumped by the paver. It spreads for laying mesh, and then spreads the top course to finished grade. Vibrator attachment available.

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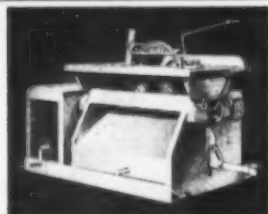
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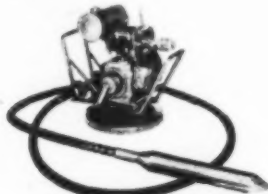
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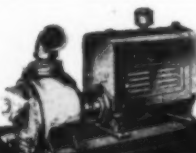
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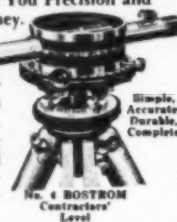
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(Continued from page 114)

vented the crews from working more than half the elapsed time. High speed is credited to well organized crews and the traveling-type pug-mill mixer, the fastest known method for laying this lighter type surfacing. The contract was held by the Granite Construction Co., Watsonville, Calif., subcontractors under F. J. Twaits and Morrison-Knudsen Co.

★ ★ ★

20-ACRE

AIRCRAFT PLANT

Built in 130 Days

(Continued from page 65)

for one 150-ft. bay for final plane assembly) and is one story high, with 16-ft. clear height between floor and roof trusses which are supported by 8- and 10-in. wide flange rolled columns carried by spread footings. Floors are 5-in. reinforced concrete slabs on a 4-in. gravel cushion.

Wall design calls for a concrete base 12 in. thick and 5½ ft. high, above which interlocking cellular steel siding units 24 in. wide, product of the H. H. Robertson Co., extend to the roof line. The steel siding is backed up with 1-in. fiberboard insulation carrying a sheet metal liner forming the finished inside surface of the wall.

The building is roofed with a cellular steel deck carrying a 2½-in. insulating thickness of fiberboard covered by built-up composition roofing. With these steel units the contractor was able to lay more than 20 acres of roof at the rate of 1 acre a day and inclose the walls with prefabricated cellular steel siding at the rate of ¼ acre per day. Development of the steel siding and roofing units, both products of the H. H. Robertson Co., is said to be based on war experience of the British who found that bombing damaged only small areas of buildings of the same general type as that erected at Dallas. Repairs necessitated by air raids, it is claimed, are easily and quickly made and interference to production minimized.

A structural feature of the plant is the use of bomb baffles built of concrete 12 in. thick in front of all doors to protect openings in the event of an air attack and also to reinforce the outer walls to a height of nearly 6 ft. from the ground, thus increasing protection to the workers inside.

General contract for the main assembly building and six auxiliary structures was awarded to James Stewart & Co., Inc., of New York, who sublet the erection of 3,900 tons of steel to John Beasley, of Muskogee, Okla. For the Stewart organization Roger Peabody was project manager and Joseph Cunningham, general superintendent. The plant was designed by Allen & Kelley, architects, of Indianapolis, Ind., and J. Gordon Turnbull, consulting engineer, of Cleveland, Ohio.

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The amazing success of Smith-Mobile Truck Mixers on jobs all over the country, comes as a result of long, practical experience. Smith engineers pioneered the many features found on present day HIGH DISCHARGE truck mixers. They spent ten years in intensive research and field tests. Then came the announcement of the new Smith-Mobile. Quantity production began four years ago and since then sales have increased by leaps and bounds. Today — Smith-Mobile is the acknowledged leader in the field with an enviable record of achievement.

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1st. Smith-Mobile was the first truck mixer whose every feature of design was based on the requirements of high discharge service.

1st. Smith-Mobile was the first truck mixer with a CONTROLLED DISCHARGE, enabling the operator to pour concrete fast or slow, without segregation.

1st. Smith-Mobile was the first truck mixer to provide VISIBLE MIXING and is still the only machine in which the entire batch is visible while mixing.

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1st. Smith-Mobile was the first high discharge truck mixer to provide for shrinking and mixing of the batch as the materials enter the drum.

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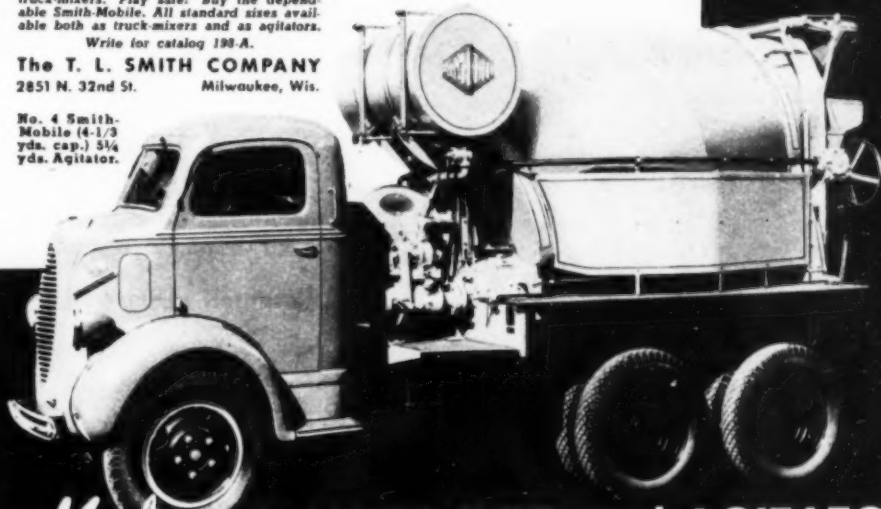
1st. Smith-Mobile was the first truck mixer equipped with a steep distributing chute, especially ideal for dry concrete.

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Write for catalog 198-A.

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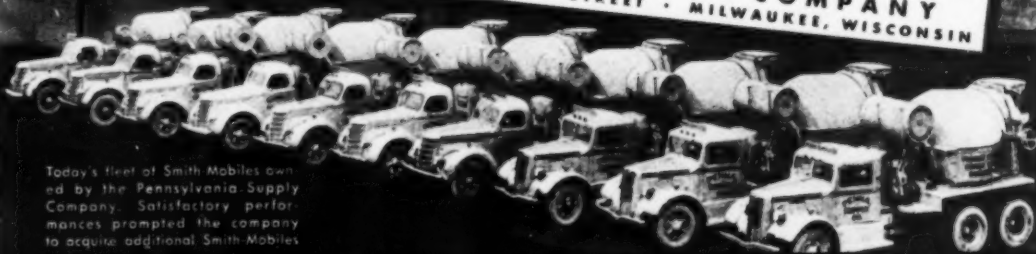


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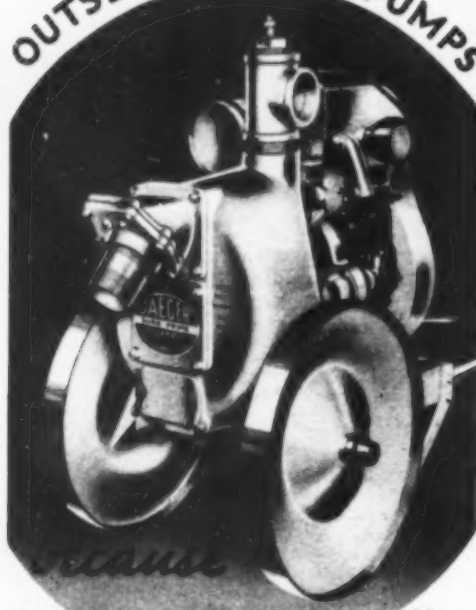
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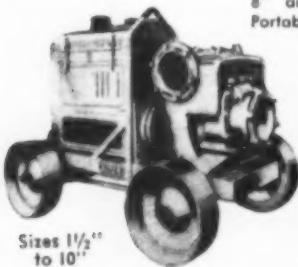
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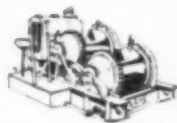


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